olume XII.
Number 2.

FEBRUARY 1897.

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TEXTILE WORLD.

With which is Incorporated the

INDUSTRIAL RECORD

The combined subscription of the Textile World and Industrial Record among textile manufacturing establishments is claimed to be larger than any other publication in this country, and comparison is invited.

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some fool will praise it, and
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Has now reached a stage where condemnation brings the latter end of our quotation to mind. : : : :

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Hesitation in the face of facts is not only unwise but in the present case expensive. A mill buying these looms when we were first ready to take orders would have the extra cost well near annihilated by this time.

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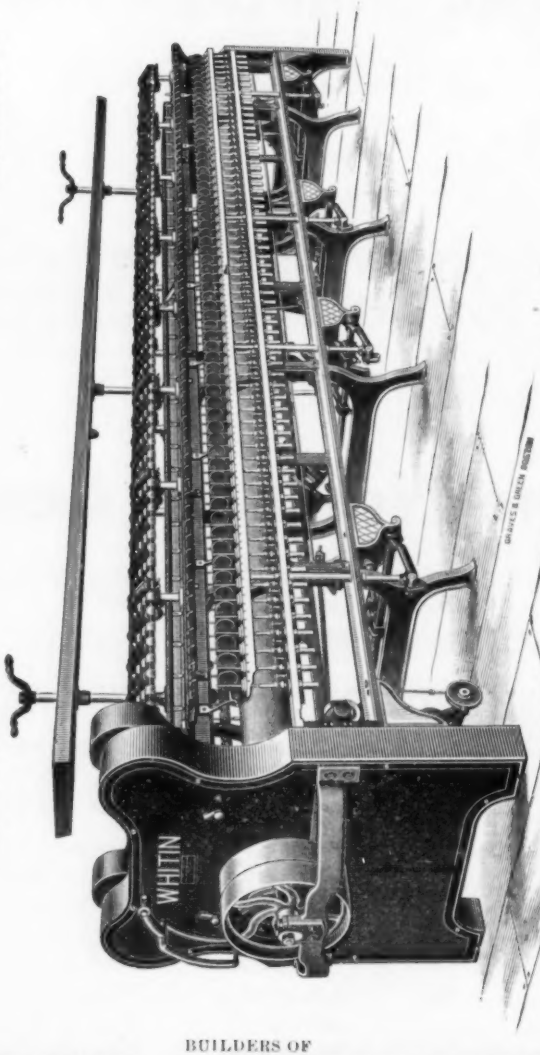

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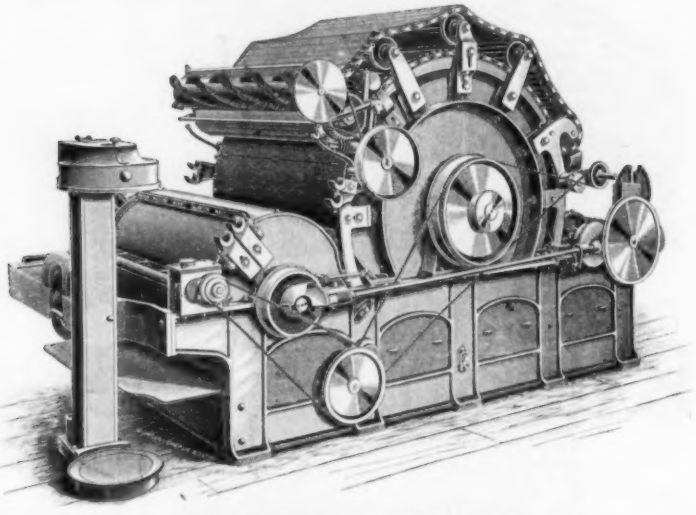

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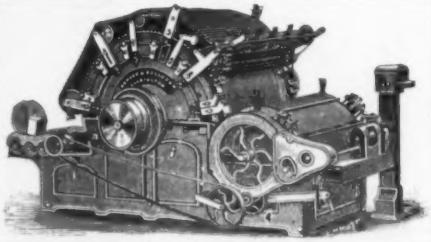

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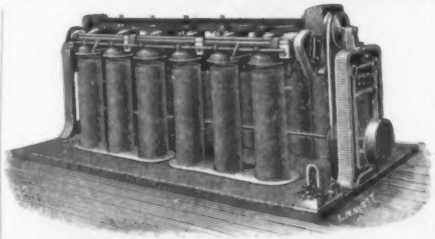

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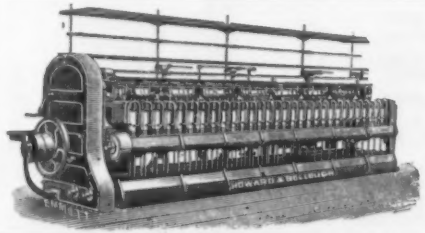

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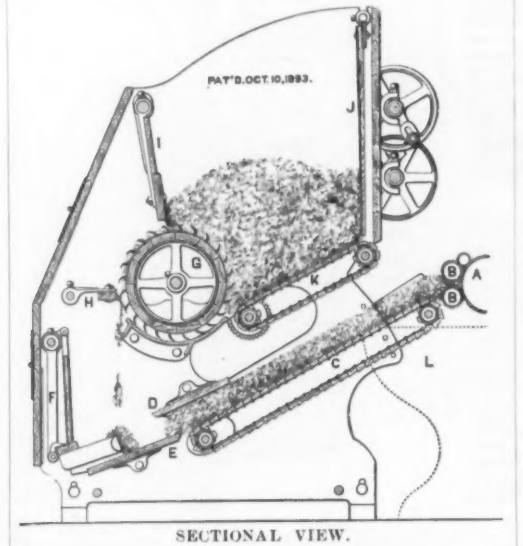

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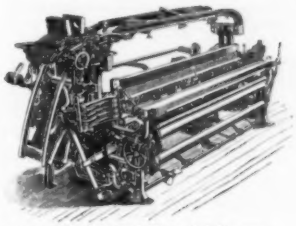
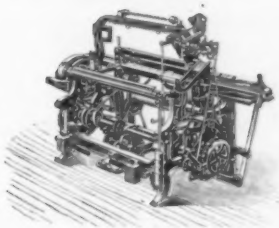


1896 Woolen and Worsted Loom.



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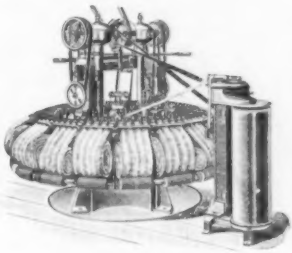

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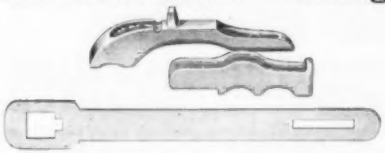

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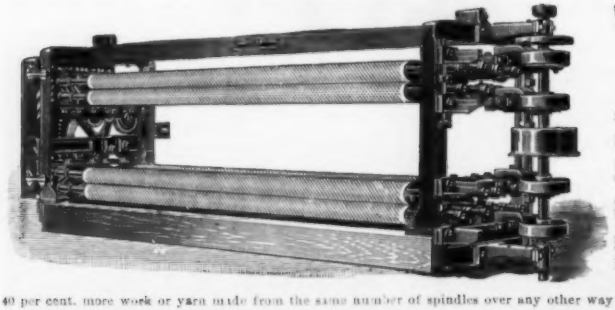

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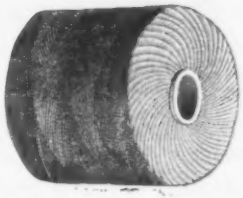

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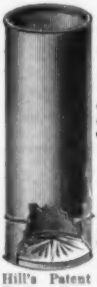

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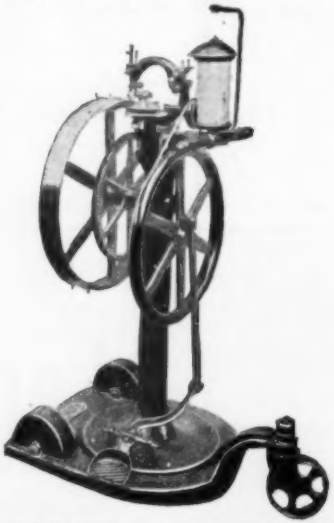

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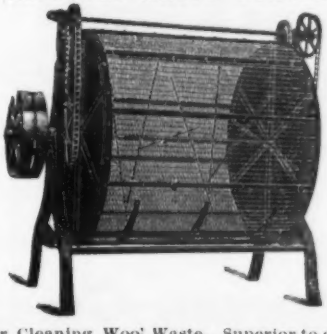

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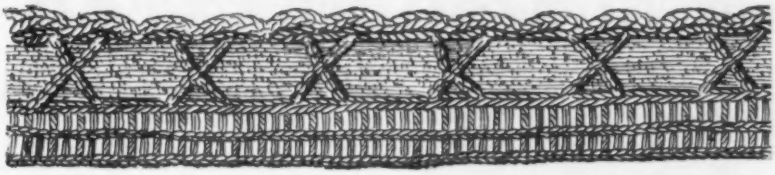

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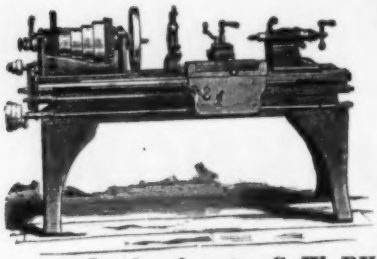

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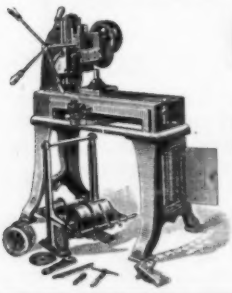

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George W. Gregory, in November, 1874, resigned his position as Principal Examiner U. S. Patent Office to enter the firm.

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List of Textile Patents Issued January, 1896.

Specifications and drawings furnished for ten cents each. Address W. S. Gavey, P. O. Box 222, Brooklyn, N. Y.

Card with Revolving Flats. 575,565. G. Fauquet, Rouen, France.

Carding Machine. 575,852. W. D. Rosencrantz, Hohokus, New Jersey.

Carding Machine Condenser Take-up roller. 575,851. W. D. Rosencrantz, Hohokus, New Jersey.

Cloth Washing Machine. 574,944. H. N. F. Schaeffer, Lowell, Mass.

Cop Doffer. 575,084. W. D. Whitaker, Philadelphia, Pa.

Crinkling Silk. 574,401. Caud P. Deponilly, Paris, France.

Doubling and Twisting Frame. 574,941. C. H. Richardson, Lowell, Mass.

Drawing Frame. 575,558. E. and S. Tweedale and J. Smalley, Manchester, England.

Fastening Card Clothing to Top Flats. 575,986. J. C. Potter, Pawtucket, R. I.

Jacquard Mechanism Comber Board. 574,383. A. Brauch, Paterson, New Jersey.

Knitted Garment. 575,726. F. H. Moon, Hyde Park, Mass.

Knitting Machine. 575,760. J. Schmitt, Cologne, Germany.

Knitting Machine Narrowing Apparatus. 575,395. F. H. Grauz, Chemnitz, Germany.

Knitting Machine Pattern Producing mechanism. 575,336. A. T. L. Davis, Laconia, N. H.

Knitting Machine Operating Mechanism. 575,191. L. N. D. Williams, Ashbourne, Pa.

Knitting Machine Web Needles. 575,012. G. F. Sturgess, Leicester, England.

Loom Buffer Device. 574,510. S. C. Werner, East Windsor, Ct.

A. B. UPHAM,
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FOR
Cotton, Silk, Flax, Woolen and Worsted
MACHINERY.
Roving Spindles and Flyers a Specialty.
Light Forgings. Repairing of all kinds.

Loom Take-up Mechanism. 575,297. E. W. Davenport, Hopedale, Mass.

Loom Multiplier Mechanism. 575,833. W. Wattie, Worcester, Mass., assignor to Knowles Loom Works.

Loom Shed Forming Mechanism. 575,309. J. Railton and G. O. Draper, Hopedale, Mass

Loom Shuttle Check. 575,358. J. H. Northrop, Hopedale, Mass.

Loom Shuttle. 574,864. W. F. Draper, Hopedale, Mass.

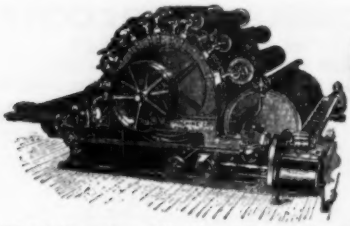
Loom Shuttle Motion. 575,927. C. H. Hendel, Glen Rock, Pa.

Loom Stop Motion. 575,307. J. H. Northrop, Hopedale, Mass.

Machine for Grinding Carding Engine flats 575 689 E. Brown, Worcester, Mass.

Mounting Top Rollers. 575,557. E. Tweedale, Manchester, England.

Pile Fabric Loom. 575,818. A. Webb, Worcester, England.



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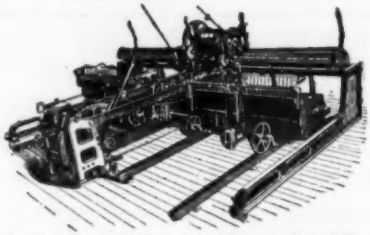

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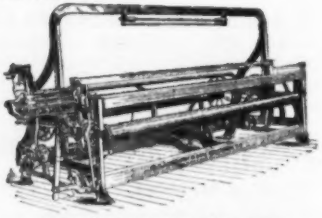

Blanket Loom No. 128.

Renovating Fabrics. 575,591. C. F. Broadbent, Baltimore, Md.

Roving Clamp. 575,310. A. E Rhodes, Hopedale, Mass.

Spindle. { 576,059. 576,060. A. Scheid, Harrison, New Jersey.

Spinning and Twisting Mechanism. 575,463. J. and R. S. Dawson, Bradford, England.

Spooling Machine Stop Motion. 575,663. G. P. Bosworth, Pawtucket, R. I.

—Massachusetts, East Dedham. There is a report that J. Edward Cochrane, who owns the Norfolk Carpet Mills in this place, and also the Cochrane Carpet Mills at Malden, will remove his entire plant from the latter place to East Dedham.

—Massachusetts, Worcester. The Crompton and Knowles Loom Works, the two largest builders of weaving machinery in the world, have been consolidated, and the business will hereafter be conducted under the name of the Crompton & Knowles Loom Works, which have been incorporated with a capital stock of $3,000,000. More complete details, list of officers, etc., will be found in TEXTILE WORLD.

—New Jersey, Cranford. A new firm has been formed, to continue the business of W. S. Taylor & Bloodgood, Jr., the felt manufacturers. There will be no change in the style of name.

—New Jersey, Newark. William Whittam, Jr., a foreman for the Clark Mile End Spool Cotton Co., has severed his connection with that company, and is now organizing a company for the purpose of manufacturing fancy cotton cloths.

—New Jersey, Paterson. A certificate of incorporation of the Cardinal Silk Co., has been filed by Andre C. Cardinal, Rudolph H. Matthies and Fred E. Fielding. The capital stock is $30,000, and is fully paid in.

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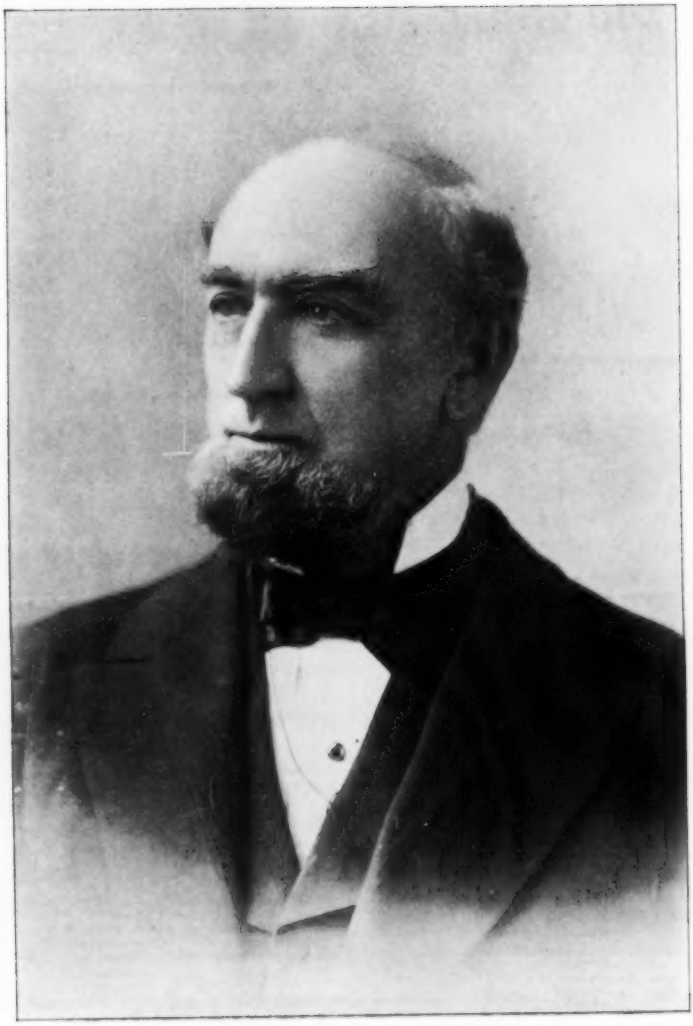


JUDGE WILLIAM LAWRENCE,

President National Association of Wool Growers.

TEXTILE WORLD.

Vol. XII. FEBRUARY, 1897. No. 2

JUDGE WILLIAM LAWRENCE.

The Hon. William Lawrence is one of the best known men in this country, in connection with matters concerning tariff legislation. He is aggressive in whatever he undertakes, working with great energy and honesty of purpose. As the chief representative of the wool growers, in their demands for a customs' tariff on wool, he has been at all times earnest and persistent in the expression of his views and in his efforts to attain his ends. His views are regarded by wool manufacturers as extreme, and, in their radical form, antagonistic to their best interests. Mr. Lawrence's great prominence in the wool industry of this country, and the leading part he is now taking in securing for wool growers a high tariff on the raw material, naturally would excite on the part of the readers of this magazine a desire to know more about the man and look upon his portrait which we give on the opposite page.

Hon. William Lawrence, A. M., LL. D., of Bellefontaine, Ohio, lawyer, jurist, statesman, author, was born at Mt. Pleasant, Ohio, June 26, 1819; graduated at Franklin College, September 1838, valedictorian of his class; graduated at the Cincinnati Law School, March, 1840; admitted to the bar in November of that year; was reported for the Ohio State Journal in the House of Representatives, 1840-41; studied medicine and surgery in 1841-43 in aid of his legal profession; practiced law from July, 1841 to 1897 at Bellefontaine, except when otherwise officially engaged; was prosecuting attorney for Logan County 1845-46, and has had a lucrative practice in several States, and in the Supreme Court of the United States, including some of the largest land cases ever heard in that court. He was the leading counsel in the great cases in several States, involving the title of the church property of the Church of the United Bretheren in Christ, growing out of the schism in that church in 1839.

He was a member of the Ohio House of representatives, 1846-48; member of the Ohio Senate, 1849, '50 and '54; is author of the Ohio Free Banking Law, after which the National Banking Act was in part modeled; was editor of the Logan Gazette, 1845-47; was reporter for the Ohio Supreme Court and reported Volume 20, Ohio Reports, 1851; was Whig candidate for Presidential Elector, 1852; was Judge of the Common Pleas and District Court in Ohio, 1857 to 1864; was one of the editors of the Cleveland Western Law Monthly, 1861-64; in 1862 was Colonel of the 84th Ohio Volunteer Infantry, serving in Maryland; in 1863 was appointed by President Lincoln, District Judge in Florida, but declined; was elected a Representative in Congress in 1864, and under re-elections served ten years; was one of the counsel selected by the Republicans in Congress under the act of January 29, 1877, and argued

for the claims of the Republican Presidential Electors of Oregon and South Carolina before the Hayes-Tilden "Electoral Commission;" in 1880 was one of the organizers of the Ohio Bar Association; in 1881 was elected first Vice-President of the Red Cross of America, of which Clara Barton is president; was First Comptroller of the United States Department of the Treasury from July, 1880, to April, 1885; was a trustee, by several successive elections, of the Ohio Wesleyan University from 1878 to the present time; was a lay delegate to the General Conferences of the M. E. Church, 1872, 1876, 1880, 1892; in 1871 he organized the Bellefontaine National Bank and was its president from that time to January, 1896, when he declined a re-election.

He is now and has been since its organization a director in the Ohio National Bank, Washington, D. C.; was a delegate to the Farmers' National Congress at Chicago, 1887; at Montgomery, Ala., 1879; at Parkersburg, W. Va., 1894; at Atlanta, 1895; and at Indianapolis in 1896. He was a delegate to the National Convention of Wool Growers at St. Louis in 1887; in Washington, D. C., 1888 and 1889; in January, 1891, was elected president of the Ohio Wool Growers' Association, and by annual re-elections has so continued ever since; in October, 1893, was elected president of the National Wool Growers' Association and so remains.

He has made more speeches and written more newspaper articles on the wool tariff, than any other citizen of the United States.

In January, 1897, he made the principal argument before the Committee of Ways and Means of the House of Representatives in Washington, D. C.

In 1884, he was elected a member of the Philosophical Society, of Washington, D. C., a select body of learned men; is now first vice-president of the National Statistical Society, of Washington. The degree of A. M. was conferred on him by his *alma mater*, and the degree of LL. D., by three Ohio colleges.

He is author of: (1) The "Law of Claims Against Government," 1875; (2) the "Law of Religious Societies," 1883; (3) the "Organization of the Treasury Department," 1881; (4) the "Law of Impeachable Crimes," 1867; (5) "Introductory and concluding chapters to Lectures of J. B. Helvig, D.D.," 1876; (6) "Chapters in History of Champaign and Logan Counties," 1872; (7) the "Causes of the Rebellion," 1888; (8) "Decisions of First Comptroller," 6 vols., 1880-85; (9) "Sketch of the Life and Services of John Sherman," 1888; (10) "Dissertation on Clithrophobia," Medical Science, 1887; (11) the "American Wool Interest," 1892, published by the American Protective Tariff League; (12) Chapter thirty-five on "American Wool," in the volume, "One hundred Years of American Commerce," New York, 1895; (13) most of the United States documents on the wool tariff, viz.,: (1) Miscellaneous Document, No. 149, Fifty-first Congress, First Session; (2) Executive Document, No. 3, Fifty-third Congress, Special Session; (3) Senate, Miscellaneous Documents, Nos. 35, 77, 124, Fifty-third Congress, Second Session; (4) Senate Document, No. 17, Fifty-fourth Congress, First Session; (5) No. 17, Fifty-fourth Congress, Second Session; (6) "Arguments before the Senate Finance Committee," Report No. 2332, Fiftieth Congress, First Session, part 3, p. 1954, etc., and part 4, p. 2170, etc.; (7) "Arguments before the House Committee Ways and Means Tariff Hearings", Fifty-first Congress, First Session, 1889-90, p. 215, etc.; (8) "Argument before the Committee of Ways and Means," January, 1897, in favor of a wool tariff.

His (1) miscellaneous law articles in law journals; (2) his speeches and pamphlets used as political campaign documents in presidential and other elections; (3) his judicial decisions; (4) his miscellaneous addresses, if collected, would make several volumes, besides (5) his speeches and reports in Congress. He is yet in the full vigor of manhood and of usefulness.

The Tariff.

There remains no doubt of a very early revision of the customs' tariff law, at an extra session of Congress, to be called soon after the inauguration of Mr. McKinley. There is also no doubt of its being other than moderate and satisfactory to the demands of the industries of this country. There is no demand, and, therefore, there is no expectation that a high tariff will be recommended or enacted. It would be the height of folly to attempt anything different, in a political or industrial point of view. No material changes will probably be made in any of the textile schedules, except in that relating to the manufacture of wool affecting the raw material, and the ad valorem qualifications affecting cotton yarns. A new classification is favorably considered concerning fine cotton fabrics with over 300 threads to the square inch. Each year sees the necessity of more protection to our fine cotton manufactures, and for these, higher rates are demanded and their equity is recognized. Some changes may be made in the tariff on cotton hosiery to meet more equitably the present conditions of trade, and the rates be made more specific than ad valorem. The revision will be mostly in the line of adjusting rates to the specific form.

Representatives of the wool manufacturers and wool growers have met in convention according to a previous arrangement, but, at present writing, nothing has been accomplished in the way of an agreement, due to the radical position taken by the wool growers, whose ultimatum, as submitted by Judge Lawrence, is for twelve cents a pound on class 1 and class 2 wools; double duty on washed, and triple duty on scoured; 8 cents a pound on all carpet wools, and double and triple duty on washed and scoured, and 3 cents a pound additional duty on all skirted wools. This is what the wool growers have practically contended for all along; and, it is our opinion, unless new developments present themselves, no agreement will be reached other than on this basis; and unless some satisfactory understanding is arrived at, tariff legislation affecting the woolen schedule will be a very uncertain quantity. In order to carry any scheme through the Senate that manufacturers may have in hand, something will have to be done to pacify those senators who are inoculated with the ideas of their wool constituents. But the question is, whether manufacturers are not more willing to take their chances of holding on to the advantages they already have under the existing law, than submit to the demands of the wool growers and to the influences they may have in Congress. Wool manufacturers have now a defective, but, nevertheless, a protective tariff on their class of products, and also free wool, which is unquestionably to their benefit. This was obtained from a not particularly friendly Senate, rather from one much less favorably disposed than the one that will come into existence after the fourth of March. Then again manufacturers have a tariff obtained without the assistance of wool growers. Can it not be done again? We are almost inclined to believe that it can. The rates of duty on woolen yarns and cloths are not really bad, as they are to-day. If the rates could be converted into specific from ad valorem, the position of the manufacturer would be fairly good, if not entirely satisfactory. It may be conceded that wool growers should have a measure of protection for their commodity, but if it is accorded to them, it will be done to satisfy the principle of protection and against the true interests of manufacturers.

Ramie.

The chief obstacle attending the commercial use of the ramie fibre is the great difficulty of separating the bark, or, more properly, the bast, from the stem. The methods that are now in

vogue for the degumming of the fibre ribbon, or the bast itself, meet present requirements very well and do not need much further attention. Great efforts have been made, and many ingenious machines have been invented, to accomplish the desideratum of separating the bark from the stem in sufficient quantity to bring the cost of the ribbon down to a close parity with that of flax. We have quite recently received letters and declarations from those holding patents of ramie decorticating machines, assuring us that the problem had at last been solved. But this has been the claim of all inventors for the last twenty-five years or more, and yet there has been no machine that could be denominated a success as meeting necessary requirements. We have before us a letter from New Orleans, from the proprietor of a decorticating machine, who asserts that he has a device that will handle large quantities and deliver the ribbon straight, a feature of much importance. Of course, this party desires some capitalist to take hold with him and establish a plant for preparing ramie for the degumming process. Almost in the same mail came a letter from a party, not many miles from Boston, who says that all who have seen his machine acknowledge that it is at last the "only" machine that will answer the purpose at a small cost.

We have made more or less inquiry into these recent inventions, and have yet to discover anything particularly new or in advance of those heretofore made. When these machines have been brought to a practical test upon a commercial basis, they have been found to be wanting in essential features. A machine is wanted that will take the dry ramie stalks and strip them properly and in large quantities. The stripping of the green stalks is easily accomplished, comparatively, but that necessitates the mechanical operation being done on the field of growth, which is impracticable. The Department of Agriculture has a good system for testing the merits of these machines; but few inventors, however, care to have their devices subjected to these tests, because, heretofore, such devices have not come up to the required mark. The usual reply to the Department's request is that the construction of the invention is such that it cannot be tested under government rules, which is an absurdity. These trial tests bring out the value of the machine on two points, viz.: output of fibre in a working day, and quality. It is impossible to tell what a ramie machine will actually do by looking at drawings, or even at the machine itself. For instance, one of the machines that were under trial in New Orleans, in 1894, was simplicity itself, and its work on single stalks was perfection; but under test to show an output of fibre equal to the yield of ten tons of green stalks and leaves, the product of an acre, in one day, which was the claim of the patentee, the machine failed utterly. This output, when three or four attendants are necessary, is the least that can be accepted, and the fibre must be clean, straight, unbruised and untangled. This output means only 400 to 500 pounds of dry fibre, which shows that the problem is a serious one.

Wool and its Consumption.

The leading statistical authority in the world concerning the movement of wool may be accepted as Helmuth Schwartze, London, England, whose annual report for 1896, is just at hand, from which it is well to note that the past year presents two salient features which influenced the market in opposite directions and practically balanced each other. On the side of production the decrease in the Australian clip, and on the side of consumption the collapse of American demand for European goods. It was predicted in the early part of 1896, that the wool clip of Australia would be short, but as similar predictions had been made in former years and not realized, there was a doubt if such a

thing would follow for last year. As a matter of fact, however, the prediction proved true and a shortage of 125,000 bales became a matter of record. It is noteworthy that the shortage consisted wholly in the supply of merino wool, the quantity of cross-bred wool being the same as for the year before. The result upon the market was an advance of 10 per cent. on merino wool between January and the end of March. This proved an excessive advance in price, and was lost before the end of the year. As the relative supply of crossbreds was greater, the price for these was not so materially affected. At the present time it may be said that merino sheep breeding is on the decline, relatively, not only in Australia, but elsewhere, and in place of it, more attention is being given to cross-breeding. For the current year the prospects are that the production of wool in the River Plate States will show an increase, mostly of cross-bred wool. Australia, however, is likely to prove stationery at most, and possibly show a small decrease. The supply as a whole will therefore be distinctly moderate, particularly as regards merino wool, the production of which, taking the colonies and the River Plate States together, has practically not increased since 1861.

Values have greatly fallen in the last sixteen years, and even within the last twelve years. In 1880, the total number of Colonial bales imported into Europe and this country was 1,088,000, valued at $110,000,000, and in 1896, the total number thus imported was 2,134,000 bales, valued at $128,000,000. Thus it will be seen that the number of bales imported in 1896, was over 99 per cent., while the value was less than 19 per cent. greater than in 1880. The tendency of less attention being given to the raising of merino sheep is a natural one in the settlement of any country, as a result of the pressure of agricultural and manufacturing enterprises. The sheep industry, in which wool is a desideratum, has always been and always will be a pioneer occupation, giving way to the demands of higher industrial pursuits. This not only holds good for Australia and the Argentina, but also for the United States.

Style Suggestions for Woolen Manufacturers.

The rapid change of styles which characterized the market some few seasons back has given place to a more quiet, and consequently a more healthful change. The principal passing of old fabrics is that of the kersey. This fabric has undoubtedly had its day, and buyers realize this, but what to substitute is the problem which is now puzzling every one in the trade. Some have made rough melton twills. Such a fabric has recently been put upon the market, and while it is a step in the direction of something different from a kersey, still buyers feel that it is not exactly the thing to fill the place of the latter. These same twills with the melton finish have been made in worsted cheviots, but here again the demand is only slight, the general feeling being that this also is not the fabric.

The fancy back covert cloth is selling largely, and is assuredly ahead of anything to fill the place of the kersey; the principal trouble being in its manufacture, the obviating of streaks in the face.

The principal lines to sell are the cheap cheviots, and 70 cents is the popular price. Above this figure the buyer will only go in case of exceptionally good coloring and style. Worsted cheviots are only selling in the cheaper goods, and in these, as in the wool cheviots, style is everything. Fine worsteds in all fabrics of this class are obtaining a ready sale, and plaids in dark browns are the styles which have the best call.

Knit Goods Manufacturers Organize.

The knit goods manufacturers of this country have been contemplating, for some little time, the question of having an organization of their own, principally to represent them on tariff matters before congressional committees. In pursuance of this purpose, an organization was effected the early part of this

month, it being conceded that nothing could be done by individual efforts, while little could be accomplished by sectional representation. The views of those present, however, were that the present tariff law needed little or no modification, but there was need of some improvement in the administration of it so as to prevent undervaluation. It may be noted that those generally interested in this organization are manufacturers of cotton hosiery, etc., upon which there is, at the present time, an ad valorem duty of 50 per cent. The absence of a specific duty, which is to be deplored, has enabled unscrupulous manufacturers abroad, with the aid of confederates in this country, to ship large quantities of manufactured goods at an undervaluation. It is not only defrauding the American revenue, but injuring the domestic manufacturers. This is what it is desired to correct This is the proper course for manufacturers to take, that of organization for purposes of this kind, as it is clear that they can accomplish nothing through individual efforts. Hosiery manufacturers, however, that use wool, can work to much better advantage through the National Association of Wool Manufacturers, an organization that is formed to look after their interests as well as others in which this raw material is employed.

The Crompton and Knowles Loom Works.

The most important event that has occurred for many years and has attracted the greatest attention in the textile field, is the late consolidation of the two famous concerns, Crompton Loom Works and Knowles Loom Works, both of Worcester, Mass., under the corporate name of The Crompton & Knowles Loom Works, with a capital of $3,000,000. This consolidation is destined to have a bearing upon the textile manufacturing industry of the United States, of the utmost consequence. It takes in two works, the largest and pre-eminently the first of their kind in the world. Their specialties are known the world over and held in the highest esteem, paramount to all others. Their position among looms is the same, though, if anything, more marked, than the Corliss type among steamengines. Inventive genius of the very highest order has been called into play to make them exquisite specimens of mechanism. No expense has been omitted in commanding the brightest and more sagacious talent in the attainment of success. The policy that has actuated both companies will, undoubtedly, actuate the one. The combination is so gigantic, that competition with it is out of the question, still the character of its officials is a sufficient guarantee that whatever monoplizing advantages it may possess, they will not be used other than to the profit of its customers. The new corporation can date the beginning of its history back to 1837, when William Crompton took out his letters-patent for a power loom for weaving fancy designs, followed in 1840, with its first practical operation in a factory. The history of the Crompton loom since then has been wonderful and fraught with immense consequence to the textile industry of the world. Though the Knowles loom has not been so long identified with the textile affairs of the factory, it has exerted a no less influence, during the period of its existence, upon the character of the manufactured product. The two looms have each had its friends and admirers and strenuous believers. This will probably continue, and the difference in the essential principles of their construction will long remain an interesting point for discussion. We expect to see favorable results follow the combination.

Foreign Trade for 1896.

According to the custom house statistics just at hand, the imports of cotton in 1896 amounted to 47,318,524 pounds, which was a decrease of 6 per cent. of

the quantity imported in 1895, though there was an increase in value of nearly 8 per cent. Most of this cotton came from Egypt, and was purchased for the production of fine qualities of yarn. There was a decrease in the imports of knit goods, such as stockings, hose, etc., in 1896, as compared with 1895, of about 21 per cent. The imports of wool for 1896 were 159,776,015 pounds, which was a decrease of nearly 36 per cent. of the quantity imported in 1895, the decrease being chiefly in the merino grades. This was, in a measure, a reflection of the comparative state of the woolen manufacturing business for these two years. The imports of manufactures of wool showed a large decrease, of nearly 40 per cent. in 1896, as compared with 1895, the decrease being almost entirely in the value of cloth and dress goods.

A Tariff Commission.

The desire that there should be a tariff commission, non-partisan in its make-up, before which all questions relating to customs tariff shall be submitted and the report thereon made to Congress, is a most commendable one, and if it were at all feasible, it should be carried out; but there are many obstacles in connection with this that are apparently insurmountable. The tariff is a revenue measure, and this must have its legislative origin in the House of Representatives. Congress cannot shirk its duty in this respect, and all revenue matter must originate with the House. The tariff as a protective measure is not recognized by the Constitution, and in practice it will be found, in our opinion, difficult, if not impossible, to disconnect it from party politics. Such has been its lot since the beginning of the government, and it will not be easily done away with. It is well known what the success of the tariff commission was that was organized in 1882, resulting in its recommendations being disregarded and cast one side when presented to Congress, and instead a tariff measure distinct from its suggestions was passed. The business community undoubtedly would be pleased to see a tariff commission formed, free from any partisan influence; but, is it practicable? We fear that it cannot be easily made so, as there are too many industrial interests at stake. The members of the commission should be appointed for life, during good behavior the same as the general appraisers, and the selection made from the two great political parties, the same as the latter body.

Elements of Prosperity.

The elements of business prosperity for 1897, are to be seen in various directions, and perhaps no more so than in the statistics of exports from this country as compared with former years. For 1896, there was exported domestic merchandise to the value of $986,844,193, which was an increase of over 22 per cent. more than was exported in 1895. The principal exports were agricultural products, which constituted over 67 per cent. of the total. The exports of manufactures were 26 per cent. more than for the year 1895. On the other hand, the imports into this country were nearly 15 per cent. less in value than in 1895. The increase in the value of exports for 1896 over 1895 was due, in a large measure, to the increase in the value of agricultural products. For instance, the average value of wheat exported in 1895, was 63 cents per bushel, while for 1896 it was 70 cents, and the period of most active export coincided with the greatest advance on the price of this commodity. The conditions attending our export trade are similar to those that existed prior to 1880, which were the direct cause of the great revival of business at that time. Our mining industry is on the increase, and the improvement therein suggests a brighter outlook for industrial enterprise. The prospects are also favorable to a large

increase in railroad construction during the current year. Nothing of late has proved more indicative of this than in the recent disruption of the steel-rail pool and the purchase of an immense quantity of rails, equal to the entire annual production, reported to be 800,000 tons, at a drop in price of from $28 to $17. This heavy purchase is expected to put in employment many thousand hands, with a material decrease in the cost of track laying or renewals for railways.

Our Color Pattern Supplement.

It is with much pride that we call attention to our pattern supplement, opposite page 64, showing in colors the most recent styles in covert cloths with fancy backings. Nothing of this kind was ever before attempted by an American textile journal, and it is made possible at this time, on account of recent foreign inventions. The process for an exact illustration or representation, in color, of a textile fabric, is still quite expensive, and would not be attempted by this magazine, were it not its purpose at all times to be in the van of progress, and give to its readers the very best and latest of what there is going on.

—In a recent conversation with General Appraiser Lunt, he stated that, according to his views, the woolen schedule of the McKinley bill was about right in its construction, if the dividing lines could be left out. At this time, of course, it is impossible for us to say what the recommendations of the Committee of Ways and Means will be, but, if our information is to be relied upon, it will be much in harmony with these views. It has been found impracticable to have specific duties on woolens, similar to those applicable to cotton goods, *i. e.*, on the count system, in which the number of threads to the square inch is made the basis on which to establish a duty. The value of a tariff is the provisions for its administration so that it may be accomplished in as simple a manner as possible.

—Those who are advocating the imposition of a discriminating duty of 10 per cent. on merchandise imported in foreign vessels do not take into consideration that in order to effect anything of this kind, our treaties with foreign countries will have to be changed very materially, a matter that cannot be accomplished without much diplomatic disturbance. Those advocating such a measure for a customs' tariff little realize what they are asking for.

—A very interesting experience was told to us the other day by a manufacturer, to the effect that a lot of Wyoming wool was recently sent to London for sale, and there purchased by an Antwerp concern, who had it scoured and again placed on sale to be bought by a New England woolen manufacturer and brought back again over the water to the latter's mill. The wool has just arrived. This is the first instance of the kind that is on record, of American wool going to a foreign market, being sold twice over and then bought by an American manufacturer.

—This is the way American machinery is appreciated abroad. We note in the advertising columns of one of our English contemporaries the following American devices for sale, though made in English shops: ring travellers for spinning and doubling, made at Preston, Lancashire; Whitin gravity spindle, made at Bolton, and Grinnell sprinkler, made in Manchester. This is a flattering record.

—Fancy hosiery is making a strong bid for popularity, and some choice novel effects have been brought out this season by importers of French and German goods. Many importers have faith in fancy styles, but as yet they derive little encouragement from the limited demand coming along, as the demand is almost entirely confined to black goods, with a sprinkling of tans.

The Lowell Textile School.

The opening of the Lowell Textile School, Lowell, Mass., was an auspicious occasion, taking place on the first of this month in the presence of His Excellency the Governor of the Commonwealth and members of the Legislative Committee on Education, besides many others connected with, or deeply interested in, the textile industries of the State. This is the first institution in New England, for teaching the theory and practice of textile manufacturing, and is principally the result of a movement which originated in the Lowell Board of Trade, under the inspiration of its secretary, James T. Smith, at a time when Massachusetts capital was seeking investment in the textile industries of the South, and when it seemed necessary to stop this apparent hegira and retain for the State all the capital that rightfully belonged to it. To Mr. Smith, more than to any other one individual, is due the credit of the textile school being established in this manufacturing centre.

A special car attached to one of the regular trains left Boston at one o'clock, noon, with the Governor and other Boston guests. Lunch was served at the Merrimack house, after which a reception was given at City Hall by Mayor W. F. Courtney; the party then proceeding to the school for its inspection. The school in its mechanical equipment is ready for practical instruction, especially in the cotton department, which is in complete order, due to the active interest taking in it by Superintendent C. L. Hildreth of the Lowell Machine Shop, the latter furnishing the greater portion of the machinery. The motive power for operating the machinery is derived from electric motors set on platforms hung from the ceiling. When completed, the mechanical plant will be an epitome of a cotton and woolen mill. The school has over 20,000 feet of floor space, the rooms being well lighted and pleasantly located. There are four principal apartments, the first being a room devoted to wool and worsted spinning machinery; the second devoted to cotton spinning machinery, from the picking to the spinning; the third devoted to weaving and adjunct occupations; and the fourth devoted to recitation and lecture rooms, in which are the necessary number of blackboards, designing boards, stereopticon, etc. Some of the machinery to be seen at the school is very highly finished, having been manufactured for exhibition at the World's Columbian Exposition We understand that there have been about sixty-five applications, the first coming from Bombay, India. It is the intention of the superintendent of the public schools in Lowell, to arrange the curriculum of his schools to conform to the course of the textile school.

After the inspection of the school the guests went to Huntington Hall, for the more formal exercises. A. G. Cumnock, president of the trustees and agent of the Boott Cotton Mills, called the meeting to order and made the opening address, in which he said that the object of the school is to give "instruction in the practical knowledge necessary in the cotton, woolen, worsted, silk and other textile industries, in science and art as applied to these industries, and in the processes and methods for the purpose of improving any special trade, or of introducing new branches of industry. It is essentially a trade school, and the whole plan provides for such instruction only as will be found useful in textile trades."

Mayor Courtney was introduced, and extended the welcome of the City to the guests present. Senator A. S. Roe, chairman of the Committee on Education, spoke with much eloquence for the Commonwealth in the absence of the Governor. Mayor G. S. Junkins, of Lawrence, spoke briefly, and was followed by S. N. D. North, secretary of the National Association of Wool Manufacturers, in a most scholarly address,

of which we give the following abstract. His subject being "Industrial Education—What it Means and Why it is Important. Mr. North said:

We have met to celebrate the marriage of education and industry in Lowell. In establishing here a textile school, your city is placing itself well in the forefront of the most beneficent movement that distinguishes our age from those that have gone before. You follow a pathway well blazed; but you enter it at a time when your example must accelerate a movement more backward in the United States than in any country which we acknowledge as in any sense our peer. Lowell is the first city in the Commonwealth to take advantage of the Act of Massachusetts Legislature passed in 1895, by which the State gave $25,000 to each of our four chief textile manufacturing cities, provided each should contribute an equal amount towards the founding of a textile school. We hope and expect that the other cities, Lawrence, Fall River and New Bedford, will follow the example of Lowell. Whether they do or not, you are about to inaugurate a school which, while of special value and interest to your own people, will throw open its doors to all the State, to all New England; a school planned on no narrow local lines, which welcomes all who may seek its privileges, and expects to establish intimate relations with every city, town and hamlet where there exists a mill engaged in the making of any kind of textile fabric.

It depends upon the future of this school whether or not that legislative act shall be followed by other acts under which the Lowell Textile School, and other like schools, shall increase in resources, enlarge in scope, and grow in usefulness. That law of 1895 should be the beginning of a series of laws, culminating finally in the full recognition, by the Commonwealth, of the fact that industrial education is become the chief corner-stone in the making of the modern State. The logic of that recognition will be the ultimate incorporation of institutions like the Lowell Textile School into the public school system, as an internal part of that system.

Lowell was the first city in the world in which factories were built before the grog shops had opened their doors. Lowell has grown to magnificent proportions. It stands second to but one city in the United States in its production of textiles, and the number of cities in all the world that surpass it in machinery capacity can be reckoned on the fingers of one hand. We have now to look, for our workmen and foremen, for persons who can intelligently grasp the modifications, based upon science, which are constantly being introduced into these industrial processes. It does not follow that we require professional chemists, physicians, mathematicians and artists to carry on manufacturing. But the times do demand artizans sufficiently familiar with the broad principles which underlie industrial operations to be able to adapt themselves to new conditions.

We are not dealing with the relations between labor and capital in any of their ordinary aspects, nor entering into any field of controversial discussion, when we say that there is one point at which the interests of these two mingle in an indivisible unity, in a way that cannot be overlooked without injury to both. The establishment of this textile school is a recognition of that fact.

It rests upon two truths as corner-stones. I. Whatever tends to increase the general efficiency of the artizan improves the quality of his workmanship, and is thus of the utmost value and importance to his employer. II. But it is of even greater importance to the artizan himself. If there is one thing more certain than another in this day and generation, it is that no man can get ahead in his industrial status, against the competition of his fellowmen, unless he possesses superior skill and knowledge in his specialty.

These two truths are bound together by ligaments that cannot be cut. The advance in manufactures has enormously increased the reciprocal dependence of employer and artizan. I use that good old-fashioned English word "artizan" notwithstanding that it has been allowed to slip almost wholly into desuetude. People have got into the habit of thinking that because a man operates machinery, that therefore he must be called an "operative," and can no longer be regarded as a worker in industrial art—a skilled and trained man, just below the grade of the artist. We are guilty of other solecisms, as when we speak of the work done by machinery as manufacturing, which means making *by hand*. If the operative is no longer an *artizan*, it is his own fault, and not the fault of the machine.

To be continued in next issue.

Immediately after these exercises a banquet was held in Mechanics' Hall, under the auspices of the Lowell Board of Trade.

Lowell Textile School.

INSTRUCTORS C. P. BROOKS AND FENWICK UMPLEBY.

Christopher P. Brooks, the director and principal professor of the Lowell Textile School, is known principally in connection with technical education, but is at the same time a practical manufacturer.

He was born in Lancashire, England, and on graduating from the Queen Elizabeth School, at Blackburn, entered the old established Park Place Mills of Pilkington Bros. & Co., to learn the cotton mill business. Here he spent several years.

Mr. Brooks in 1889 took the highest Honours Medal at the annual examination of the City and Guilds Institute for proficiency in cotton manufacturing and has also achieved distinction in the examination of the South Kensington Science and Art Department.

After learning the business, he obtained the position of mill superintendant, and for ten years he held this position and, later, that of general manager of the Great Harwood and other mill companies, and was a regular and well known attendant of the Manchester Royal Exchange and Liverpool Cotton Exchange. Simultaneously with this and about the time when public attention in England was drawn to the good work being done by German, French and Swiss Textile Schools, Mr. Brooks was one of the pioneers of a movement in favor of such institutions in England, and conducted for some years one of the first textile schools in Lancashire.

Afterwards he was appointed by the City and Guilds of London Institute, to whose supervision and abundant resources technical education in England owes so largely its development, examiner of textile schools for all England, serving in that capacity for five years. He resigned the position in order to come to this country. During the period of this examinership of textile schools, Mr. Brooks has frequently been deputed to visit the

C. P. BROOKS.

European Continental countries to report on new industries or on textile schools. He is the author of two standard text books, "Cotton Manufacturing," now in its sixth thousand, and "Weaving Calculations," equally successful. Mr. Brooks has had an extensive practice as expert in adjusting differences in connection with cotton mill work and in consultation as to textile machinery patents and processes. His first introduction to United States manufacturing circles was at a meeting of the New England Cotton Manufacturers' Association at the Profile House last September, when he read a paper. At that time, and for some time previous, he had been in this country as consulting textile engineer for a large firm engaged in establishing and equipping Southern cotton mills, with headquarters at Charlotte, N. C.

He will lecture before the Society

of Arts of the Mass. Institute of Technology on February 28th, on the Development of Textile Schools in Europe.

Fenwick Umpleby, instructor in the woolen and worsted department, was born in Huddersfield, Yorks, England, in 1852. He is of Holland-Scotch descent. His father was an architect and fancy rustic work designer of considerable note. At the age of 14 years Fenwick was put as an apprentice to the woolen business with Etchells & Apperley (of Apperley feed fame) of Huddersfield and South Brent, Devon. Here Mr. Umpleby stayed 12 years, having gained a thorough knowledge of raw materials and woolen stock. He was made overseer at the age of 18 of the sorting department, working himself up to the position of head sample clerk. From here he obtained

FENWICK UMPLEBY.

the position as manufacturer and designer for Hewitt, Haigh & Wilsons, Armley, Leeds. It was at this position when he first entered the textile department of the Yorkshire College, where he studied four consecutive years, each year winning the first prize and first certificates. Having now obtained a full and practical knowledge of designing, he left Leeds and went to Robert Brearley & Sons, Queen Street Mills, Batley, England, as head designer. This firm made all classes of woolens and worsteds, figured and plain. During his stay at Batley, Mr. Umpleby entered the international contest for the best three designs, each of Figured Matalasse, Worsted Dress Goods, and Men's Suitings, winning the first prize—silver and gold medal. From Batley he came to the United States to start a mill on fancy cassimeres and Mackinowes for Jas. Lees & Sons, Bridgeport, Pa., staying there two years; thence going to the Globe Woolen Co., Utica, N. Y.

From the Globe, he went to the Auburn Woolen Co, Peterboro, Canada, staying there two years and leaving to come back to the States, direct to the Geo. H. Gilbert Manufacturing Co., Gilbertville, Mass., where he has been designer on all classes of woolen and worsted goods for ladies' and gentlemen's wear, for nearly five years. The late Professor John Beaumont, of Yorkshire College, speaking of Mr. Umpleby's work, said: He has not only done good work, but the very best work of any student I have had in the college for eleven years.

Fibres.

BAMBOO, BETEL NUT PALM AND CABBAGE PALM.

W. S. GAVEY.

The illustrations in this article are from photographs taken expressly for it.

Although every one is familiar with bamboo, the connection between this plant and a fibre is rarely made in the mind, yet in Eastern countries this is one of the most useful grasses on account of its tough fibrous stalk. When one looks at the illustration and realizes the immense size of the stalk by comparing it with the man standing alongside, it is hard to realize that bamboo is nothing more than a gigantic grass. The species shown, *Bambusa Arundinacea*, grows to the height of 70 to 80 feet, and from a parent root in clusters or clumps, as illustrated. These trunks grow almost to the top without a leaf, and then the foliage is very dense, in some species being covered with spines. This is planted as a barricade against troops, and in East Indian countries will often stop the regulars. Bamboo grows in all the countries in the south of the Eastern and Western hemispheres. Some species have a covering so hard that if hit with steel, fire is struck. The Chinese use the leaves for plaiting into hats, but the chief fibre use of bamboo is in paper making. It is only the young shoots which can be used for this industry, but if cultivated rightly could be made a paying crop.

In the West Indies three harvestings have been made in two years, and in some places plants have grown twenty-five feet in a few weeks. The experiment of using bamboo fibres with wool and silk has been tried, but the tedious process necessary to prepare the fibres has made the economical use of them, for that purpose, entirely out of the question.

GIANT BAMBOO.

The Betel Nut Palm (areca catechu), is a tall, graceful tree, growing to the height of forty to fifty feet, and is usually less than a foot in diameter. This palm produces the betel nut of the East, the chewing of which, with quicklime and the leaves of the betel pepper, is considered etiquette, although the practice causes the loss of the tree and produces a drowsiness which becomes chronic with continued use. The wood of the trunk of the tree is yellow on the circumference and dark red at the heart. The centre core furnishes the catechu of commerce which is used for coloring matter and medicinally. The leaf contains much fibre, and is used in a crude state in Singapore for twine, and also by the East Indians for making water vessels, caps, dishes, etc. It is a tree

of vigorous growth, and is widely distributed throughout tropical countries, and is possessed of so much fibre that it could undoubtedly be used economically in the manufacture of paper.

The Cabbage Palm (corypha gebauga), is one of the most useful of the Eastern palms. It is a native of Java, where the fibre is used to a very large extent, the trunk furnishing a kind of sago, and from the roots a medicine is obtained. The leaves are large and full of fibre, and from them are made cloth, hats, baskets, etc., furnishing employment to many people.

BETAL NUT PALM. (See page 36).

English Textile Industries in 1896.

The history of the cotton-spinning industry for the past year, says one of our English exchanges, if not of a particularly cheerful character, may generally be considered as showing a very slight improvement over the immediately preceeding year's returns. Indeed, it would appear that the pernicious results of the large and absolutely unwarranted extension of spindles in 1889 and 1890 are at last being overset, although perhaps this condition of things is to be more directly attributed to the failure of some of the older concerns, rather than to an increased demand for yarn. So far as Oldham and district is concerned, things appear to be going steadily worse, for while 56 companies earned in the aggregate profits of about £86,000, 36 companies sustained losses amounting to about £39,200, the net balance of profit being about £46,800. This on a paid-up share capital of £3,800,000 gives a return of almost 1 1-4 per cent.; but if the loan capital of £2,800,000 also employed be taken into account, and the interest paid thereon be reckoned at 4 1-4 per cent., it will be noticed that on a total capital of £6,600,000, the return shown is only about 2 3-8 per cent., as against a result of 2 7-8 per cent. last year, of which the interest on the paid-up share capital gave 1 5-8 per cent. Further, it may be noted that the adverse balances of 53 companies amount to about £363,000, and the credit balance of 39 companies to £42,000, or a net adverse balance of, say, £321,000. Turning to the manufacturing branch of the trade, we find the past year almost universally described as unrenumerative. When a steady dimunition of the num-

ber of productive spindles is accompanied by an increase in the number of looms, no other result can reasonably be expected; indeed, it appears that manufacturers are now courting disaster by reckless over-extension. Some confirmation of this view is afforded by the fact that notwithstanding the large number of looms running short time, the year's output of cloth exceeded that of 1895 by about 150,000,000 yards. The prospects for the manufacturer are, therefore, not of a very hopeful character. Glancing at the progress made in India and the Far East during the year, we find that a steady increase in the number of mills is still taking place in India, while in China there will be within the next few months some 430,000 spindles in operation, of which 230,000 are in mills in Shanghai, which have been built with foreign capital. An interesting question at the moment is the competition between China and Japan. It is calculated that after deducting all expenses, and on the hypothesis of complete freedom from taxation, yarns manufactured in China leave a clear profit of 17 1-2 per cent., and yarns manufactured in Japan and carried to China can be sold there at a profit of 10 per cent. If, therefore, the Chinese Government puts into practice the intention now attributed to it, and imposes a tax of 10 per cent. on yarns manufactured in China, profits accruing on the latter will be reduced to 7 1-2 per cent., as against 9 1-2 per cent. accruing on imported Japanese yarns, thus affording Japan an opportunity of competing with the Chinese spun yarn, which we may be sure will be taken full advantage of.

CABBAGE PALM. (See page 36).

Chemistry of Textile Fibres.

There is scarcely any subject of so much importance to the bleacher, textile colorist, or textile manufacturer, as the chemistry of the fibres with which he has to deal. By the term "chemistry" we mean not only the composition of the fibre-substance itself, but the reactions it is capable of undergoing when brought into contact with various chemical compounds, acids, alkalis, salts, etc., these reactions having a very important bearing on the operations of bleaching and dyeing, and, as often as

not, some influence on the question whether the fibre is of service in the production of textile fabrics.

A correspondent to the Textile Mercury, England, says that the physical structure of a fibre, its length, form, etc., have great influence on its spinning properties. Large numbers of fibres are known which, in consequence of some peculiarity of structure, shortness of staple, smoothness of fibre, etc., cannot be used in producing textile fabrics, yet which are available for other uses.

There is an exceedingly large number of plants that are known to be capable of yielding fibres. In India alone it is estimated that 300 fibre-yielding plants can be found, of which 100 are in greater or less use for various purposes. Other parts of the earth produce other fibre-yielding plants which do not grow in India, hence it will be seen that the number of plant fibres must be great; and yet how few, comparatively speaking, have met with any extensive use in the manufacture of textile fabrics! These may, indeed, be counted on the fingers. It is evident that there is plenty of scope for investigation into the capabilities of the little-known or little-used fibres, to see what those capabilities are.

Fibres are met with in connection with plants in three ways. First, as cuticle or ciliary fibres or hairs; these are of no practical use, being much too short, but they play an important part in the physiology of the plant. Second, as seed hairs—fibres that are attached to the seeds of many plants, such, for instance, as the common thistle and dandelion; the cotton fibre belongs to this group of seed hairs, while there are others that have been tried from time to time in spinning and weaving. These seed hairs vary much in length—from 1-4 inch to 1 1-2 or even 2 inches; each fibre consists of a single unit. Whether it is serviceable as a textile fibre depends upon its structure, which differs in different plants, and also upon the quantity available. The third class of fibres, which is by far the most numerous, consists of those found lying between the bark or outer cuticle of, and the true woody tissues of the plant. This portion is known as the bast, and hence these fibres are known as "bast fibres." They are noticeable on account of the great length of the fibres, in some cases upwards of 6 feet, which can be obtained; but it should be pointed out that these long fibres are not the unit fibres, but are really bundles of the ultimate fibres aggregated together to form one long fibre, as found in and obtained from the plant. Thus the ultimate fibres of jute are really very short, from 1-10 to 1-8 of an inch; those of flax are somewhat longer. When the chemistry of these fibres comes to be considered, we shall see that the length of the ultimate fibres has some influence on the methods of chemically dealing with the fibres. Jute, flax, China grass, hemp, are common fibres which are derived from the bast of the plants.

There is one important point of difference between seed fibres and bast fibres, that is, in the degree of purity. While the seed fibres are fairly free from impurities, cotton rarely containing more than 5 per cent., the bast fibres contain a large proportion of impurity—from 25 to 30 per cent., as they are first obtained from the plant; and this large quantity has much influence on the extent and character of the treatments to which they are subjected.

As regards the structure of the fibres, it will be sufficient to say that while seed hairs are cylindrical and tubular, and have thin walls, bast fibres are more or less polygonal in form, and are not essentially tubular, having thick walls and small central canals.

The English Silk Industry Declining.

At a recent meeting in England of those interested in the silk industry of that country, some interesting remarks were made by the speakers concerning

the past and present status of the silk industry in that country. They admitted that the silk industry there was declining. Foreign silks were being imported into that country at fabulously low prices, keeping the better article out of the market in some places, and that had a telling effect upon wages. When they came to consider the amount of silk that used to be manufactured, it seemed to them that the silk trade was doomed to extinction if something was not speedily done to prevent it. At one time a million of people were employed in the silk industry in that country; now there were not more than 50,000. In Spitalfields, at one time, 62,000 people were employed; to-day there were only about 1100.

One of the speakers was Thomas Wardle, well known as an authority, who stated that the essential questions seemed to him to be, what could be done to help improve matters in the future? There had been a great change, of course, during the last fifty years, in weaving, it would be said, in the substitution of the power loom for the hand loom. He could remember the time in Lyons when there was hardly such a thing as a power loom, and when he went there now it was difficult to see a hand loom. The silks were nearly all woven by power looms, and they were excellent figured silks, too. That had made a great difference. England had been very slow in adopting the power loom. Things were becoming a good deal more equalized, because even in Macclesfield the power loom had been adopted for figured silks for dresses with very great success. He was bound to say that he did not see any immediate remedy for that trade unless they got protection again. He had a very strong conviction on that point. He thought the fiscal policy of this country had been a blunder. What was done in 1860 with regard to the silk trade was simply ruinous. Nobody disputed that. It was beyond dispute. The imports being in the year when the duty was taken off £3,000,000, they jumped up the next year to nearly double. Owing to the foreigners using their chance, and no duty being paid, they brought in double the quantity of silks, and with it actual distress, till now last year the amount would not be less than £20,000,000, if they considered the price of silk. That was a very serious thing. He believed there were some people in this country who did not need protection. There were some people strong in mind, determination, and ability, who were superior to any aids that protection could bring. But protection was a word which made one think of its opposite—that of weakness. People were not constituted all alike, and the greatest number were not strong, particularly in capital. There were houses with plenty of capital who could make very rapid strides in coming up with foreign competition. People with very great ability, too, could overcome every difficulty, but others, who had not those advantages, mental and monetary, were at a great disadvantage, and when they saw the world turning as it had since 1860 to protection, except England, they found they were at a very great disadvantage.

Duty on Yarn.

Geo. Sykes, of the Hockanum Mills, Rockville, Conn., has written as follows to one greatly interested in obtaining a modification of the tariff on worsted yarns, which we are permitted to publish: "You and your friends can rest assured I shall do what I can to have the rates on yarns placed where they ought to be, as compared with the rates on goods. I wish you would have all your yarn people write to the Republican members of the Ways and Means Committee, advocating the rates I propose, of three times the duty on wool in the grease, and 30 per cent. ad valorem. I think they will all see the justice of these rates, which give the spinner more than his share of the duty placed on goods."

English Exports of Machinery.

We give below the statistics of the exports of textile machinery from Great Britain to foreign countries. It will be seen that the export of such machinery is on the increase, and as compared with either 1894 or 1895 the increase is very considerable, the Continental countries taking by far the greater portion. The amount of machinery that was exported to the United States in 1896 was about the same in point of value as in 1895, but greatly in excess of that in 1894. The statistical showing is a remarkably good one for the machinery trade in that country.

	January–December.		
	1894.	1895.	1896.
To Countries in Europe . . .	£3,649,291	£3,924,117	£3,956,492
" United States	233,470	477,960	476,742
" Countries in South America .	283,974	266,145	178,540
" British Possessions in South Africa	764	1,391	8,894
" British East Indies . . .	766,442	826,336	1,245,727
" Australasia	4,095	14,220	16,915
" Other Countries	540,780	641,334	871,038
Totals	£5,478,816	£6,151,503	£6,754,348

Origin of Factory Legislation in England.

Anyone acquainted with the domestic systems of industry that prevailed over all civilized countries until the advent of the present epoch of mechanical invention, will not wonder that, in the destruction of the domestic systems that followed, and the substitution for them of the modern mechanical ones, including, as this did, their organization into what has come to be known as the factory system, many evils arose which imperatively demanded the intervention of the Legislature. The short cut to the modern El Dorado which the opening of the gates of invention gave to the adventurers of the latter half of last century and the early part of this, greatly excited them, and in the rush that followed it was not always that due regard was paid to the rights of the workers, or care taken to avoid the infliction of wrongs.

The great increase in the productive capacity of the mechanical over the manual systems of working, soon, to a great extent, destroyed the latter, owing to the very limited markets which existed at the time in which the articles produced could be disposed of. The first result was the displacement of a great amount of labor, and the consequent impoverishment of those who had hitherto found employment in the domestic manufactures. Happily, however, the change did not come all at once. Hargreaves's jenny, Arkwright's water frame and Crompton's mule, while they displaced the domestic spinners, originated a considerable demand for their services as weavers; and at that time nearly every domestic spinner could weave as well as spin, so that this change hardly caused any appreciable amount of distress. Nothing of the kind is recorded in the annals of the times as arising from it. It is different when we enter the present century, and find Cartwright's power-loom beginning to make its influence felt. This brought swift ruin to the handloom weaving industry, without providing any new system adequate at the moment to absorb the energies of the displaced workers. They therefore struggled on, fighting a hopeless fight against inevitable defeat. Streams of immigrants from the country villages to the towns began to set in, seeking employment in the new mills that began to spring up in the small places that have since become populous towns. Those who continued the fight, or who were too old to adapt themselves to the new method of working, were subjected to successive "cut-

downs" or reductions of wages, until it was no longer possible to subsist in the meanest manner upon their earnings by their now obsolete hand-looms. The stronger turned their energies into such labor and menial occupations as they were fitted to perform or as were obtainable, and the poorhouse and the grave in due time absorbed the remainder. A few years ago two or three weavers following their antiquated handicraft, benevolently maintained at it by the sons of old employers.

The change from hand to power weaving was mainly effected in the twenty years from 1830 to 1850. Under the influence of the commercial legislation then existing, the transition from one system to the other was far more rapid than the expansion of the distributive powers that scattered the productions of the industries abroad. Hence industrial and commercial panics were frequent and severe, and at the best of times there was a large portion of the population inadequately employed. In the severe depressions referred to, the numbers of the employed were largely augmented, and the greatest distress was frequently suffered.

It was in the midst of these evils that many of the wrongs that called for legislative remedies took root and flourished, low wages, excessively long hours, the inconsiderate employment of children, and the cruel treatment inflicted upon them by those under whose supervision they were placed, and finally the introduction of a system under which employers, instead of paying wages in the current coin of the realm, compelled their employees to receive them in the form of meal, milk, flour, groceries, clothing, etc., often charging exorbitant prices for these and setting them against the wages account. Sometimes these were distributed from the warehouses of the mills; at other times from shops established in the villages, and at which the workpeople were expected to make their purchases. It will be obvious from these observations that a wide door was opened to fraud and oppression, and to the infliction of grave evils which no civilized State could witness without attempting to find a remedy for them. The factory system which was rapidly spreading over the country, offered, in its early stages, many facilities for the perpetration of these classes of wrongs.

The first attempt to organize English labor under the factory system was made in the silk industry, by Thomas Lombe, in his celebrated silk throwing mill, at Derby. This idea was undoubtedly borrowed from Italy, whence Lombe had surreptitiously exported his models of silk machinery. In all probability this suggested to Hargreaves, the Blackburn inventor, and Mr. James, his partner, its introduction to the cotton trade, from which very likely sprang the first successful cotton spinning factory in the world, which was erected in Mill Street, Nottingham, now Bow Lane. Hargreaves's machines at first were purely manual, and were operated by the attendants. Arkwright speedily followed, with a small structure adapted for his spinning frames, in Woolpack Lane, in the same town. The motive power here was that of asses or horses. A short time afterwards the mill at Cromford was erected, water being the motive power employed for driving. The success of this venture quickly led to the erection of many more, among the earliest being mills at Holywell, Manchester, Chorley, Preston, Blackburn, Paisley, etc. From these places they gradually spread over the areas now known as the manufacturing districts.

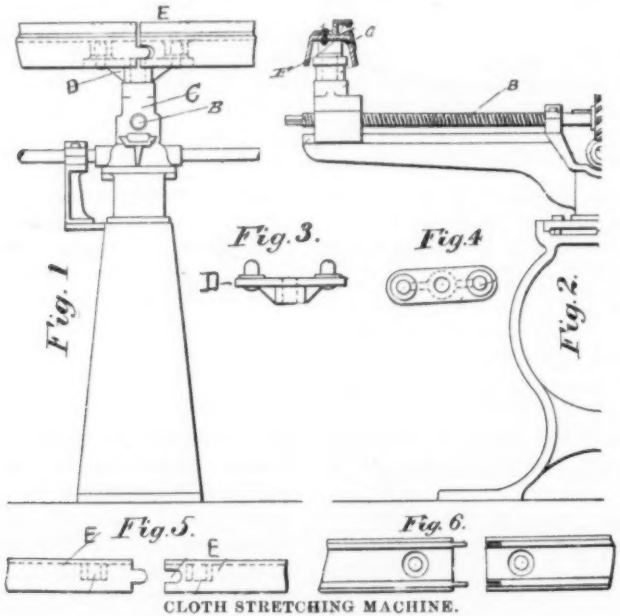
There was, in these early days, a strange, yet strong, repugnance to working in the factories, no doubt brought about by mistaken motives as to the effects it would have in the depreciation of the morals of children, and of girls especially. That this was a mistaken notion is proved by all subsequent experience, as the morals of factory workers have on the average

been as high as those of other artisans and laborers in all other spheres of industry. Only the stern pressure of circumstances, the loss of employment on one hand, and its offer on the other, overcame this reluctance. At last its acceptance became general, and with that it ceased to carry, as a consequence, any sense of a depreciation of social position. It was owing to this opposition, however, that employers were driven, for the sake of obtaining operatives in the new industry, to scour the country for apprentices, which were mainly obtained from poorhouses and among the classes of persons who were under the care of Boards of Guardians—who were generally found ready enough to relieve themselves and the rates at the same time by apprenticing the children to work in the new mills. As might have been anticipated, labor obtained from such sources was not always properly treated or cared for, and it was excessively driven. Accordingly before the close of last century, cries were beginning to be heard for supervision and control.—[Textile Mercury.

Cloth-stretching Machine.

We illustrate, herewith, a cloth-stretching machine, made by the Phenix Iron Foundry, Providence, R. I. The machine relates to tentering frames, and is intended to more effectually stretch the fabric. Its principal feature consists in a novel joint for the tenter rails, but it is otherwise of interest in its various details of construction and arrangement of parts.

Figure 1 is a side elevation of the tentering frame showing the improved joint. Fig. 2 is a cross sectional elevation of a portion of the machine to which the device is applied. Fig. 3 is an elevation in detail of the pivot plate used in the joint. Fig. 4 is a plan of the same. Fig. 5 is an elevation in detail of tenter rails at the joint; and Fig. 6 is a plan of the same.



CLOTH STRETCHING MACHINE.

From the standards of the frame extend the usual cross arms, and along each of these is adjustable a saddle *C* upon which the rails are supported. Motion is transmitted to the saddles by means of screw threaded shafts *B*, supported by the cross arms and entering threaded openings in the saddles, motion being given to all the threaded shafts by means of worm wheels.

Upon the saddle *C* is a plate *D* pivoted to it through an opening, and provided near each end with a lug, which lugs enter cavities, provided therefor in the end of a tenter rail, thus pivotiug each rail at its ends to one of the plates. To prevent the rail *E* from becoming vertically disarranged, tongues project from one rail and enter recesses in the abutting end of the adjacent rail.

Many forms of ways for the tenter hook chains may be employed, but that illustrated is preferred. In this construction an angle plate *F* fits upon the rail *E*, one part of said plate being raised a distance to admit the passage of the chain and then extending over the chain parallel with the rail proper. This angle plate is adjustably secured to the rail by means of a bolt, thus making it possible to use the same frame with various thicknesses of chains. A lip depends from the top of the plate *F* and this together with the plate *G* serves to prevent the chain from falling out of the way. The plate *G* is also made adjustable vertically to accommodate different sizes of chains, but chiefly to permit of the chain being removed by simply unfastening the plate and withdrawing the chain from the recess in the angle plate *F*.

The chief advantage of the frame lies in the use of the pivoted rail joint.

Roller Bearings.

We here illustrate an invention which, for consumers of power, cannot fail to be of very great interest. The roller bearings manufactured by the Mossberg & Granville Mfg. Co., Providence, R. I., have been tested in many lines of service, and have shown a wonderful reduction of friction. When it is realized that in the driving tower and main line of shafting alone there is lost in friction an average of nearly one-third of the total power developed by the engine, and in some individual cases as high as 50 per cent. is thus consumed in these bearings, any device which has been actually demonstrated to reduce this friction is an important factor. Figures 1, 2 and 3 show the roller bearings complete. In its original form for plain journals, as illustrated, the bearing consists of a bushing or cage, solid or split, as necessity may require, with or without end collars, having its internal diameter slightly greater than the journal, and its external slightly less than the bearing box This shell is bored with a series of longitudinal holes, which are carefully reamed to size, and carry steel rolls as shown. These may be hardened or not, as required, but are always ground to an absolutely accurate diameter.

These bearings are made in a great variety of sizes, and are in use on a

FIG. 1.

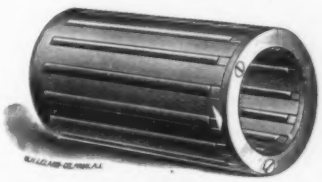


FIG. 2.

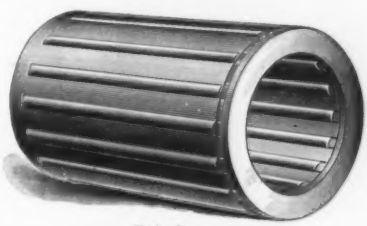


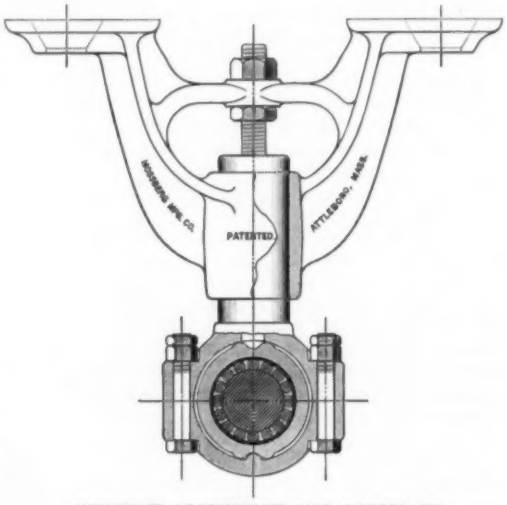
FIG. 3.

ROLLER BEARING CAGES.

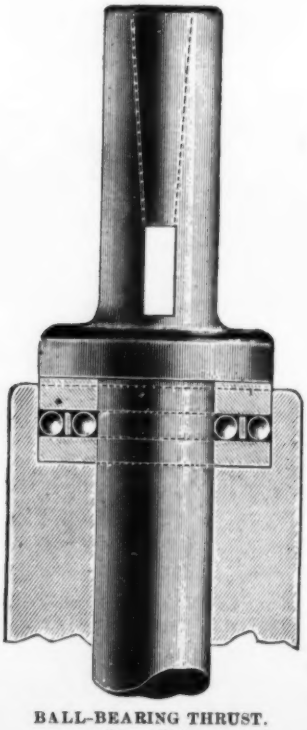
number of different types of machines. They are especially efficacious in dryers, mangles, calender rolls, openers, squeeze rolls, main shafting, driving towers and pillow blocks. Wherever plain bearings heat and cut, ball bearings would naturally be crushed or their cases grooved by the enormous pressure, while the Mossberg roller bearing has been tested under most difficult conditions, and, it is claimed, will always run smoothly, and outlast all other bearings.

The company guarantees total absence of heating from friction, and a saving of 25 to 75 per cent. of the power previously used, varying according to the different conditions under which the bearings were placed. Estimates have been made for fitting up the main line and driving tower of a cotton mill, showing that the bearings will, beyond question, pay for themselves in less than three years, and probably the time can be reduced to two years, in which these bearings will have paid for themselves.

Some idea of the duty of this bearing may be gained from the fact that it sustains a weight of 20 tons revolving 260 revolutions per minute. For light work, a ball-bearing thrust is made with either one or two rows of balls. This ball bearing, of course, is only applicable to lighter work than that for which the roller bearing is designed.



PERFECT ALIGNMENT AND ACCURACY.



BALL-BEARING THRUST.
2 Rows Balls.
Showing application to Drill Press Spindles.

Peroxide of Sodium and its Employment for Bleaching.

Extract from a German lecture delivered by Dr. Voltmer.

The peroxide of sodium is in some respects calculated to replace all the hitherto used bleaching agents for animal fibres, especially wool and silk, as well as vegetable fibres, and, recognizing this fact, the Aluminum Company in England suspended the manufacture of aluminum and went into that of peroxide of sodium, after having acquired the title to the best patents. After thoroughly experimenting with the material, and recognizing its merits, it sent its chemists into the different technical laboratories of cloth mills, and into every larger bleaching establishment in England, to teach the chemists and bleachers working in them, and this free practical course of instruction remunerated them to such a degree that after several weeks they were compelled to quadruple the quantity manufactured at the beginning. . . . . .

Peroxide of sodium is nothing but a

concentrated very cheap peroxide of hydrogen, and all the advantages of the latter are also present in the former. The bleacher is thereby his own manufacturer of hydrogen peroxide; he simply orders a few boxes of sodium peroxide sent, and with them he can prepare as much material as if he had a large number of carboys of fluid hydrogen, because the sodium yields in dissolving, fourteen times its own weight of commercial hydrogen peroxide, which contains only about 3 per cent. actual hydrogen peroxide in 97 per cent. water. Peroxide of sodium, when dissolved, dissociates into hydrogen peroxide and caustic soda, and in order, therefore, to neutralize the alkaline property of the latter, certain acids or salts must be added, for which purpose sulphuric acid and Epsom salt are most appropriate. This done, the bleacher has after this operation the ordinary commercial peroxide of hydrogen. Since sodium peroxide represents fourteen times the quantity of hydrogen peroxide, it is one-half cheaper, and to this merit must be added the others, that it is far more easily transported, and will keep for an unlimited time. The various tedious processes connected with the manufacture of hydrogen peroxide are dispensed with, and the bleacher has in the dry substance before him a direct water-soluble metal peroxide.

As regards the bleaching materials, the bleaching processes must be altered according to the nature of the former; the concentration, temperature, the degree of alkalinity, and the preparing and finishing treatment of the material are sometimes of great importance. There are two principal methods for preparing the bleach bath with sodium peroxide.

I. . . . The simplest is as follows: Dissolve 3 kilograms (6 lbs., 9 3-4 oz.,) Epsom salt in the necessary quantity of cold water, say, 100 litres (105.7 quarts), and when entirely dissolved put in slowly without heating 1 kilo. (5 lbs., 3-4 oz.,) sodium peroxide, and stir constantly. The first solution must not be heated, because when the sodium peroxide is added to the hot water, a part of the active oxygen might volatilize by dissociation. This 1 per cent. solution of sodium peroxide is now ready for use. It is principally employed for bleaching the textile fibres, chiefly silk, as well as hair, hogs' bristles, etc.

II. . . . In the preparations by the second method, sulphuric acid is used in place of Epsom salt. Sulphuric acid discharges in this method the same functions as the Epsom salt does, to wit.: It neutralizes the caustic effects of the nascent soda, thus converting this into a completely neutral salt, that cannot exert the least injurious influence upon the material to be bleached. To make this neutralization of the caustic soda perfect, while on the other hand avoiding an excess of acid which naturally would also have an injurious effect, a definite proportion between acid and sodium must be observed. Add to the necessary quantity of cold water, let us say 100 litres, 1 1-2 kilos. (3 lbs., 4 7-8 oz.,) concentrated sulphuric acid, 66° B., and strew into this solution again, carefully and under constant stirring, 1 kilo. sodium peroxide. The solution is then neutral, easily ascertained by dipping in a strip of litmus paper, which precaution is to be recommended until the operator has, in the course of work, satisfied himself when these proportions are correct. If blue litmus paper, when dipped into the fluid becomes red, the latter contains too much sulphuric acid, and in this case it would be necessary to dissolve a little more sodium peroxide until the paper does no longer become red. On the other hand, if red litmus paper, when dipped into the bath, becomes blue, sulphuric acid is still wanting, and a proper quantity would have to be added.

In order to have the bath, prepared by the latter method, ready for bleaching, a solution of waterglass (silicate of

soda) is to be added. The quantity used may amount to about 1 kilo., and may be increased. A little practical experience will soon teach the bleacher. After having added this waterglass, the solution of course is no longer neutral, but feebly alkaline, in the same manner as the bath prepared with Epsom salt is. A perfectly neutral, or what is worse yet, an acid solution, would surrender its oxygen with great difficulty, for which reason the success obtained would be quite problematical.

It is barely necessary to mention that either wooden, or at most, earthen receptacles, can be used for both the sodium peroxide and hydrogen peroxide baths, because either of them corrodes metal, in consequence of which the dissolved metallic parts will soon cause a decomposition of the bath. The same effect is also produced by impurities, for instance, iron in the water, for which reason water containing metals n solution must not be employed.

The temperature in which the bleaching operation is to be effected is best established by experience. It is well known that silk withstands a far higher degree of heat than wool; for instance, chappe can be heated to 122°-144° F., wild silk to 176°, 194°, and even up to 212° F., while wool will not stand a higher temperature than, at most, 140° F. The higher the temperature is raised, the quicker, naturally, progresses the bleaching operation.

[We wish to add to the above article by saying that peroxide of sodium is a comparatively new bleaching agent, applied to animal fibres such as wool, silk, etc. It appears as a grayish, white powder, with a composition expressed in the formula $Na_2 O_2$, or approximating this. When brought in contact with water its dissolution is very rapid and much heat is envolved; the solution possessing alkaline and strong bleaching properties. George H. Hurst, in a recent work of his, alludes to this new bleaching agent and to its advantages of being in a powder form, which enables it to be conveniently handled. It can be kept a long time before losing its bleaching qualities, but in time it undergoes decomposition, passing into sodium carbonate, caustic soda and oxygen, the last being lost. Great care is needed in keeping and using it, and not allowing it to come in contact with wood, paper or other organic matters, as it is liable to set these into combustion, with possibly disastrous results. In mixing with water, only small quantities should be added at a time, or great heat is developed, which causes evolution of oxygen and loss of bleaching power.—EDITOR.]

Lactic Acid as a Wool Mordant.

A German firm has found it expedient to patent the following process for chroming wool with the help of lactic acid: First thoroughly scour and wash the wool, and then work it for 20 minutes at 75° C., in a bath containing, bichromate of potash, 1.5 per cent.; sulphuric acid, 1.5 per cent.; lactic acid of 50 per cent strength, 3 per cent.; these ingredients being previously dissolved and mixed and added to the bath gradually. Thereafter boil for half an hour. With wool showing a strongly alkaline reaction, or with very hard alkaline water, an extra 1-2 to 1 per cent. of sulphuric acid should be added during boiling. It will be found that within the time stated the wool has assumed the pure green color of oxide of chromium, whilst the bath itself is colorless and clear and entirely exhausted. With very thick cloth and felt some additional precautions should be taken. In this case it is best to first boil the goods for half an hour with bichromate and sulphuric acid only, then turn off steam, add lactic acid, work for 30 minutes, and finally boil for half an hour.

The novel feature of this process, writes E. C. Kayser in the Textile Recorder, Eng., is the simultaneous use of mineral and lactic acid, and the

principle underlying the method rests on the observation that, whilst reacting but slowly and imperfectly with chromates, lactic acid very rapidly and quantitatively reduces free chromic acid under precipitation of green oxide of chromium. This may be clearly demonstrated on boiling for two hours a solution of lactic acid (50 per cent.), 30 grs.; bichromate of potash, 15 grs.; and sulphuric acid, 5 grs., in one litre of water. A green precipitate results, whilst the supernatant liquor is quite colorless, entirely free from chromium, and of almost neutral reaction. During the process carbonic acid is freely liberated, and a strong smell of aldehyde becomes perceptible; the latter substance, in so far as it does not escape, will itself serve to reduce a further amount of chromic acid, and as throughout the process no acids are formed capable of redissolving the oxide, as would be the case with cream of tartar, complete precipitation takes place.

In presence of the wool fibre, the reaction proceeds in exactly the same manner—only, as the fibre itself absorbs a little sulphuric acid, rather more of the latter is required. To secure the best possible result, the three interacting substances must, of course, be nicely balanced. An excess of sulphuric acid would lead to the formation of sulphate of chromium, and to a corresponding loss of mordant. Again, there must be enough lactic acid to suffice for a complete reduction, and to avoid precipitation of brown chromate of chromium.

Whilst numerous trials with lactic acid alone have shown that this agent cannot, if used in the manner customary for oxalic acid and cream of tartar, successfully serve as a substitute, the process described above, on the contrary, achieves not only a saving in time and steam, but it also leaves the fibre more than usually soft and glossy, and leads to remarkably bright, fast and level colors. Moreover, since of late the market price of lactic acid has considerably declined, and since the proportions given above, 1.5 per cent. of bichromate of potash, suffices for the darkest colors, a direct advantage over the chroming process with tartar or oxalic acid can be calculated.

Certain kinds of leather, especially goat skins for the manufacture of boots, are tanned with bichromate of potash, and it would seem to be a simple process to dye these leathers with alizarine or other dyestuffs needing a chrome mordant. Experiments made in this direction, however, have been hitherto unsuccessful, and leather dyers treat chrome tanned leather with sumac extract before dyeing. Excellent results have been obtained in this way, but the Hoechst works now promise that within a short time they will perfect a process by which the chrome tanned leather may be dyed without being treated with tannin. The results obtained will be noted in these columns.

A very curious effect on half silk dress material can be got with Azo Fuchsine G. This dyes the wool red, leaving the white of the silk almost untouched, and a subsequent treatment with bichromate of potash turns the red wool to a fine black. This unexpected effect is very greatly improved by adding a small percentage of acid green and fast yellow to the mixture. The method of dyeing, for instance, is to use 5 1-2 per cent. of Azo Fuchsine G, 3-10 per cent. Acid Green GG, 2-5 per cent. fast yellow extra, in a dye bath containing 20 per cent. of acetic acid. Then add 3 per cent. of bichromate to the bath, which will be almost exhausted. Boil for half an hour and rinse well the cloth to clear the white, then work in a warm bath containing plenty of wheat bran; rinse well and dry.

A new bleaching agent in the shape of percarbonate of potash has been brought out recently. It is the result of the electrolysis of a concentrated solution of carbonate of potash; caustic

potash, and free hydrogen, being produced at one pole, and the potassium salt and a hitherto unknown acid (percarbonic acid) at the other. In a dry state the new compound is a bluish white powder extremely deliquescent, which is always a mixture of carbonate, percarbonate and bicarbonate. So far the experiments with this salt as a bleaching agent have been merely on the laboratory scale, but experts say that it seems to be suitable for the bleaching of wool and silk, but not of cotton. A Swiss factory has secured the right of making it, and it will probably be put on the market shortly as a new source of hydrogen peroxide.

Paris Novelties in Knit Goods.

Children's knitted costumes, wraps, hoods, undershirts, etc., have of late years become articles of steady consumption. This growing favor is specially due to the employment of the knitted eiderdown, which is peculiarly well adapted for children's garments, as it is soft, warm, and of a nice appearance. It is used indiscriminately for boys' garments as well as girls. Two new and dressy boys' wraps have appeared recently; one, called "Milord," is a half length little jacket, in fact, a medium between jacket and paletot. The back and front parts which are crossed over one another, drop loosely; the sleeves are set in with a few plaits. The edge and the medium broad square collar are stitched with a broad seam. The little affair is closed with three loops and frogs, which are placed at uniform distances across the breast, and with which a cord garniture upon the cuffs corresponds. The second model, called "Signor," is suited principally for larger boys, and can, as well as above eiderdown, be very well gotten up in jersey. The front parts cross with a double row of horn buttons, and one at the neck doubled over with broad square lappels, over which lie the square collar ends. Broad pocket flaps and sleeve cuffs ornamented with several rows of stitching, serve as further ornamentation. The lower edge of the jacket, which is much longer than the first, and is more deserving of the name of paletot, has no stitched seam, the face fabric is simply turned inward and sewn to the lining.

These garments are simply single colored, and when of eiderdown, they are in evidence in the delicate shades, such as white, cream, rose, sky and beige. The little Parisians wear them as street overcoat to any dress.

Superior lines of the same models are also shown, for instance those lined very elegantly with white silk, and others trimed with fur. As may reasonably be expected, girl's wraps are invariably better garnished than those for boys. Very handsome is a wide circular of dull striped eiderdown with broad double collar ornamented with a narrow border of cord silk in herringbone stitch. A broad hood shirred in different places, with silk lining, drops with three tassels over the back. Perhaps still nicer is another completely new model of similar shape as regards the general appearance, but it has a long pointed hood in another style of make. While the wrap itself is of finely striped eiderdown with wave lines between, a broad striped or checked fabric of similar or contrasting color is used for the hood. The broad flaps of the latter, as well as the entire wrap, is bound in with a fully contrasting fur like braid. Another small mantle, striped in the same manner, garnished with little ball garniture all around, is simpler; still another has a short yoke of swansdown.

As regards the costumes for larger children, the jersey is preferred to eiderdown. A cheviot or cloth-like appearance is always well liked. New for small girls is a style called Mimosa, composed of plaited skirt and a short bodice fastened with a belt. The bodice has over the breast a broad box plait set with buttons, under which (the box

plait) run together the ends of a huge lace-trimmed sailor collar. This closes with a strap with buttons; a similar strap is also around the sleeve and around the cuff. The style called Quarter-master, with plaited skirt and short jacket, open in front, continues to be well liked. It is trimmed richer than ever with straps, buttons, braids, etc.

Quite new is the jersey costume with plain skirt garnished with soutache and narrow ribbon; the jacket is trimmed throughout with cord. It is entirely loose. The side seams are open in the lower part; collar and sleeves are decorated with a satin volart. Large pearl or horn buttons, sometimes also passemeterie acrons, are used for closing. This costume is very elegant in blue, green, and bottle green, and is also well liked in the dark shades; it does not look well in black.

For boys, there has appeared a new style, called Vandyke. It consists of short knee breeches, and a long medium wide blouse, of such a length as to show the breeches only about four inches. The blouse has a very broad machine-stitched seam, and is open over the breast from neck to belts, showing a small vest. The width of the sleeve is laid into seven plaits at the wrist; buttons decorate the blouse on both sides. If this costume is wanted to be made very elegant, a large sailor collar of white or cream jersey or surah with a plaiting all around is added. Very fashionable is the long Russian blouse, or rather Raftan; it fits fairly tight, and has large outside breast pockets. It is worn together with a broad white leather belt.

Various styles of hoods and head wraps of eiderdown for children are shown; the fabric is generally patterned with either broad stripes or wave lines. Especially nice is a model in two-tone blue with a little black between. The hood consists first of a broad band laid in plaits over the fronthead surrounding the face. For the back of the head the fabric is laid into heavy rows of puffs. The whole is completed by a volart set all around, as well as by satin ribbons crossing over the hood, forming large loops upon the top of the head and in front on the neck.

Causes of Business Failures.

Bradstreet's Journal analizes the causes of business failures in the United States for 1896 as follows:

CLASSIFIED AS TO CAUSES.

Failures due to—	No. 1896.	No. 1895.	No. 1894.
Incompetence	1892	1781	1794
Inexperience	688	518	538
Lack of capital	4639	4305	4385
Unwise credits	653	603	532
Failures of others	397	299	317
Extravagance	140	128	135
Neglect	345	333	321
Competition	550	462	277
Disaster	4153	3229	3295
Speculation	182	146	108
Fraud	1395	1154	1022
Totals	15,094	12,958	12,724

—The natural color of cops and yarns is generally confined to white, bluish white, dull white, brown and a creamy tint. In selecting cottons, the buyer has an eye to color when weft yarns are required to produce a cloth that will show up a figurative pattern to the best advantage. A brown Egyptian weft carries with it certain other properties, combined in the individual fibres composing the yarn, such as a silky lustre, which lends itself to the imitation of a fabric woven from silk only. Pure white wefts are always in demand for the production of cloths such as calicoes, and where a firm has a certain reputation for fabrics, as regards color, it is incumbent on the cotton buyer to select such cottons that are of a white or bluish-white color for the weft mixings.

—G. C. Moses, of Bath, Me., believes that free wool is "theoretically correct," but "it was too expensive in practice."

—You cannot add value to anything by diminishing the measure of value with which the thing is sold or exchanged.

Cotton Market.

The cotton market for the last month has pursued an even tenor, without anything to create excitement or give to speculators any considerable margins for profit. There is nothing in the cotton goods market that warrants anything more than conservative action. There prevails an impression that the price of the raw material will remain about the same as it is now, during the season. Those who have been able to stock up till the summer months, have done so, and are therefore practically out of the market. Manufacturing during the last year has forced a spirit of conservatism, and no essential changes are anticipated until the latter part of the current year; though what effect the recent disposition of a large portion of the print cloths in the market will have upon the future course of the trade, it is impossible to say at this time. It will have a beneficial effect, no doubt; and, taking it in connection with the curtailment of production till the first of May, will have a tendency of strengthening the price of the manufactured product.

The crop estimates have not materially changed in the last number of months, the more accepted estimate being 8,500,000 bales. The consumption will be greatly reduced by the stoppage of machinery in New England, according to agreement, for three months. The curtailment of production will affect the consumption of cotton to the extent of about 30,000 bales. Although the receipts of cotton are largely in excess of what they were last season at this time, the stock at the ports is but slightly in excess of that of a year ago. Both Northern and Southern spinners have taken practically the same amount of cotton this season, thus far, as they did the corresponding time last year. The double scourge of pestilence and famine which is overrunning India, will have a most deleterious effect upon the cotton supply from that part of the world, and will have a damaging effect upon the trade of English manufacturers with that country, which, in turn, will be reflected, no doubt, upon the consumption of cotton in general. Already, our advices from Manchester state that short time is in operation in the number of looms running, and the prospect is far from being of an assuring character.

Ellison's annual review of the cotton trade for the year 1896 is just at hand, though it was cabled to this country as early as the sixth of the month. It says that so far as the calendar year of 1896 is concerned, the figures indicate that there has been only a very moderate increase in the consumption of the mills of Great Britain, and that of the mills on the Continent has not been so material as in either 1894 or 1895. The actual results for 1896 stated in bales of the uniform weight of 500 pounds, instead of 400 pounds as formerly estimated, have been as follows:

In 500-lb. Bales.	*Gt Britain.*	*Continent*	*Total.*
Stocks Jan. 1, 1896	130,000	452,000	582,000
Takings . .	3,268,000	4,118,000	7,386,000
Supply . . .	3 398,000	4,570,000	7,968,000
Consumption .	3,276,000	4,173,000	7,449,000
Stocks Jan. 1, 1897	122,000	397,000	519,000
Weekly consumpt'n	63,000	80,250	143,250

Wool Market.

At the present writing, the wool market continues a strong one, and though prices are not materially higher, corresponding to the large transactions of late, they are in a good position, and not likely to recede during the year, but more likely to advance in anticipation of a tariff on the raw material, before many months. There has been nearly 45,000,000 pounds of wool sold in Boston alone since the beginning of the year. These sales have stocked the large corporations with a large supply of wool that will answer their purpose for many months, and, therefore, will take them out of the market, except in cases where exceptionally desirable lots at favorable prices can be obtained.

Although this large quantity of wool that has been sold in the past six weeks, has passed, in a few instances, into the hands of speculators, the bulk of it has gone to meet the legitimate wants of manufacturers, for actual consumption. Ohio XX and above, may be safely quoted at 21 cents, as showing the minimum price. Where lots of this grade can be obtained at a less price, it may be expected that there is something defective about the wool. Territorial wools are selling on the scoured basis of about 36 cents per pound. This price should command a choice article. Choice Australian wools are worth about 44 to 46 cents scoured. Advices just received from Melbourne, under date of February 14, state that crossbreds are the most depressed, while merinos of exceptional fineness or fair average quality and condition, are in good competition and maintaining their excellent position as regards price. It appears from recent statistical information compiled by the Department of Agriculture, Washington, that for the year ending June 30, 1896, the exportation of domestic wool amounted to 6,945,981 pounds, valued at $855,950. This is at the rate of about 12.3 cents per pound. For the year ending with June, 1895, the exportation amounted to 4,279,109 pounds, valued at $484,463. The exportations, for these two years, of domestic wools, were the largest ever recorded. The exportation of the domestic product began to attract attention first in the fiscal year ending in 1894, when 520,247 pounds were exported. The reason for this heavy exportation is discoverable in the free wool tariff. We have been receiving of late in our ports, large quantities of carpet, or third class, wool from Argentina and from Russia, on the Baltic and Black Seas. Our merino wools have, as heretofore, come chiefly from Australia, the chief port of entry being Boston.

By authority of the board of managers of the Joint Traffic Association, the Chicago committee, composed of all eastern roads having Chicago terminals, gave notice the early part of this month, of new rates on wool, the schedule including all important cities of the East.

The new tariff almost cuts the old one in two, the following being samples of the reduction: Boston, 71 cents to 44 cents; New York, 65 to 39; Philadelphia, 62 to 37; Baltimore, 61 to 36; Buffalo, 39 to 29 1 2. These rates are for carload lots of a minimum capacity of 20,000 pounds, and a penalty of $1 a car is added for each day the car is left unloaded after 48 hours' shipment.

This sweeping reduction indicates the desire of the board of managers to protect their own roads against competition as well as the Western Association roads.

When the wool crop of the Northwest was being moved last spring, the Soo line and Canadian Pacific, by making low rates, secured a practical monopoly of the shipments from St. Paul to the Atlantic seaboard via Canada. The Chicago-St. Paul roads protested, but in vain, and then appealed to the Joint Traffic Association to join them in meeting the Canadian competition, but the policy of the managers was against such co-operation.

Among the Dry Goods Trade of New York.

Open work dress goods fabrics, commonly referred to as etamines, among the trade, are among the most popular offerings just now, and their popularity promises to steadily increase. The etamines are firmly woven with binders which prevent stretching and displacement. Open work weaves, in fact, lead in favor all round, but nowhere more than in wash goods. Plaids and checks of modest designs and softer colors are being displayed more and more, which shows that the demand therefor is steadily rising. Serges are likely to come in for more attention than for several years, their extremely low prices having enlisted new interest.

Floral designs take the lead in all printed fabrics. In many of the open work weaves of lace and lappet effect, are alternating stripes of solid weaves which are also carried out in other patterns. The aim, of course, is for variety. This leaning is shown again in French woven serges in which the color is broken by white silk hair line stripes, some close together, some far apart. Still another modification is to be found in stripes running with the warp forming squares, none of which, however, are very large. There is also a double check offered. Two toned etamines are becoming common, as are Ottoman effects produced by tinsel embellishments.

The January grist of dry goods news, as is invariably the case at this time of the year, is confined principally to notes of new locations, firm changes and the shifting of accounts.

James H. Cohen is to succeed Cohen & Olenick at 87 East Broadway.

Todd, Murphy & Co., are to do a commission business at 67 Leonard St.

Geo. F. Jempson, the resident buyer of 56 Franklin St., has added the houses of Lebeck Bros. and Chas. Franklin of Nashville, and Gardner & Patterson of Memphis, to his list.

O. N. Alford of Bliss, Fabyan & Co., was a recent visitor in this market, as was Cyrus T. Small, agent of the Lewiston Mills.

Steibenburg & Neufield are to move to 46 Walker St.

The Nonantum Worsted Co. is hereafter to sell its goods through Molten & Duval, associated with Hardt, Von Bernuth & Co.; Lewis C. Hall will have charge of certain departments.

A. J. Valentine, late of J. M. Valentine & Co., who recently went into liquidation owing to the death of a partner, is to conduct business in connection with Fred Vietor & Achelis.

The firm of J. W. Goddard & Co. recently passed its 50th anniversary. To mark the occasion the employees gave the firm a dinner at Delmonico's.

S. Floesheim & Co. are to move a few doors on Church St.

Rost, Childs & Co. will hereafter handle the account of the Riverside Mills, of Great Barrington, manufacturers of cottons. J. A. Brunder will be the active man.

Levi Soudheim & Co. are already in their new location at 514 Broadway.

John L. Dudley, of Dudley, Battelle & Hurd, has general sympathy in the death of Mrs. Dudley.

Max Soloman is to transplant himself from Canal to 26 Worster St.

H. Wolff & Co., of 545 Broadway, who recently assigned to Simon Lambert, have settled on a 33 1-3 per cent. basis.

The Bernard Mfg. Co. has opened an office for the Springfield Knitting Co., at 113 Franklin St., with J. M. Heyman in charge.

Aronson Bros. are to locate at 326 Church St.

The Continental Mills, Lewiston, have transferred their account to Molten & Duval.

Bernard Levy & Co. have forsaken Broadway for 29 West 4th St.

R. G. Whytlaw, Son & Co., importers of cottons and dress goods, are now to be found in the Constable building.

The French Mfg. Co. has relocated at 21 Catherine St.

W. J. Blackham, late with J. T. Lowe & Co., is to begin selling skirts direct.

Phillips & Hanna is the name of a new firm at 53 Leonard St. that will make a specialty of selling the product of Southern mills. It is composed of Percy F. Phillips, formerly manager of one of J. & J. Dobson's departments, and John W. Hanna, late with Wheelwright, Eldredge & Co.

Eustis L. Hopkins has been elected commodore of the Horse Shoe Harbor Yacht Club, of Larchmont.

H. C. Kroh & Co., of 678 Broadway, have failed. They may possibly pay 40 per cent.

Among other failures are those of

Chas. G. Ross & Co., of 56 Leonard St., whose assets are about a quarter of their liabilities, and H. A. Forrest & Co., exporters, of 132 Pearl St. The last named have nominal assets of $101,000, and actual assets of $10,082. Their liabilities are more than $95,000.

Arden A. Smith, long with A. D. Juillard & Co., has struck out for himself as manufacturers' agent, at 43 Leonard St. He will handle knit goods principally.

The H. B. Claflin Co. ($4140) and Margaret Daulton ($13,540), are the heaviest creditors of David O'Grady, of this city, who made a $50,000 assignment.

Chas. Weiger will hereafter represent Livingstone Bros., of San Francisco, at 43 Leonard St.

Manning A. Goodwin, for 21 years with Tefft, Weller & Co., is dead. He was formerly of the firm of Curran, Goodwin, Walker & Co., which later became Rice, Goodwin, Walker & Co. He leaves a widow and five children.

Porter Bros. & Co. have been appointed sole selling agents for the Wiley Mfg. Co., of Catskill, N. Y.

S. Michaels & Co. have moved from 101 to 40 Worster St.

Sam'l Grocock, resident buyer, has installed himself at 438 Broadway.

The Haskell Silk Co., of Westbrook, Me., has moved its local office to 70 Greene St.

H. Ostroves has gone to 531 Broadway from Canal St.

The Merrimac Woolen Mills, of 87 North St., last week shifted to the Ayres building, corner of Broadway and Leonard Sts.

The Dry Goods Alliance, made up principally of New England firms, has moved two doors on Church St.

The Syndicate Trading Co., made up of some of the largest concerns in the country, has gone from Franklin to fine offices at 2 Walker St.

Henry Shrier, of 7 West 4th St., has assigned with $40,000 liabilities.

The Dry Goods Exchange has moved from 60 to 45 Lispenard St.

Joseph Sargent, of Boston, of O. H. Sampson & Co., is directing that firm's New York office at present.

Francis H. Inloes, of Bradford, England, who held an interest in the concern of Fred Butterfield & Co., is dead.

The Hamburger Co., of San Francisco, has changed its New York office from 258 Church to 487 Broadway.

James J. Winant has succeeded Jennings & Winant, agent of the Anchor Hosiery Mill.

Patterson & Greenough, who represent the Waterloo Woolen Co., are now at 345 Broadway.

Homer F. Locke, has been elected president of the Arkwright Club, with Geo. O. Leavett, vice-president; Richard P. M. Ossiter, treasurer, and Wm. T. Shedd, secretary.

W. M. Traquair, late with Wilmerding, Morris & Mitchell, has opened a cotton goods department with Wendt, Steinhauser & Co.

Eben Sugden, manufacturers' agent, has left Worth St. for the corner of White St. and Broadway.

Early February brings a grist of additional announcements of changes in location. Among the most important new stands are: Greeley, Frost & Cushman, woolen commission, Leonard, corner Church St.; Collins, Downing & Co., woolen importers and jobbers, 576 Broadway; H. Hahlo & Co., wool and worsted importers and commission, 61 White St.; Wright, Young & Graham, importers and commission, 15 White St.; A. S. Haight & Co., knit goods commission, 49 Leonard St.; Hughes Fawcett, thread and yarn importer and commission merchant, 117 Franklin St.; Henry Lewis, manufacturer women's underwear, 70 Wooster St.; Remy, Schmidt & Pleisner, importers and commission, 26 White St.; S. L. Hecht & Co., woolen jobbers, 26 West Fourth St.; A. & H. Weil, knit goods, 456 Broadway; S. Nachtigall, cotton goods commission, 130 Greene St.

COTTON DEPARTMENT.

Crackers and Neps.

There is some mystery at times amongst spinners, yarn agents, and manufacturers as to what constitutes crackers in yarns. Some make the mistake of saying that yarn is charged with crackers immediately they perceive any white specks in the yarn. In many cases a few neps may be present in the yarn; and although their appearance is certainly a bad sign, they ought not to be mistaken for crackers. Nepped yarn is undoubtedly bad enough; but there should be no difficulty in giving it its proper and appropriate name when the yarn is examined. Neps are an aggregation of fibres which have become matted and entangled together. They may originate in the lint during the process of ginning, or they may arise in the exposed tuft of the lap sheet that is held between the feed rollers when the feed and delivery part of the lap machine is stopped, while the beater and fan are running at their highest speed. The web of the carding engine is perhaps the best place where neps may be observed, and sometimes they have an origin in the carding of the cotton.

Drawing Frame Drafts.

To find the constant number and draft of Howard & Bullough's drawing frame:

1⅛ inches dia. of back roller,
53 gear on " "
44 change gear,
71 crown "
19 gear on front roller,
16 flange gear,
34 gear on calendar roller,
3 in. dia. of " "

$\frac{53 \times 71 \times 16 \times 3}{1\frac{1}{8} \times 19 \times 34} = 248.53$ constant ÷ 44 change gear = 5.64 draft.

To find the draft of Mason drawing frame:

1½ inches dia. of back roller,
60 gear on " "
38 change gear,
100 crown "
24 gear on front fluted roller,
20 " " " " "
32 on shaft driving coiler,
18 bevel gear " "
16 " " on upright shaft,
16 " " on top upright shaft,
16 gear on calendar rollers,
2 in. dia. of " "

$\frac{60 \times 100 \times 20 \times 18 \times 16 \times 2}{1\frac{1}{2} \times 24 \times 32 \times 16 \times 16} = 234.37$ constant ÷ 38 = 6.16 draft.

To find the draft of Platt drawing frames:

1⅜ inches dia. of back roller,
50 gear on back roller,
46 change gear,
100 crown "
18 gear on front roller,
25 " " " "
35 " " small shaft,
24 bevel gear " "
24 gear on upright "
16 gear on top upright shaft,
16 end of calendar roller,
2 in. dia. of " "

$\frac{50 \times 100 \times 25 \times 24 \times 16 \times 2}{1\frac{3}{8} \times 18 \times 35 \times 24 \times 16} = 288.6$ constant ÷ 46 change gear = 6.27 draft.

—It is a well-known fact that draft rollers cannot be set to accommodate and work long and short-stapled cottons at the same time. If set for the shorter fibres, loss is entailed by the rupture of the long fibres, and, on the other hand, if set to accommodate the longer fibres, the yarn is greatly weakened by the loss of a great number of short fibres which, not being held by the rollers, are thrown off, and so accumulate on the clearers. Consequently, the result, however the rollers may be set, will be disastrous to the yarn, which will be of a weak and irregular character. It will then be discovered that the inclu-

sion of these superior bales will have utterly failed in its object. Cottons which do not resemble each other in point of texture should not be blended together. If any great difference exists in this respect it is found that the cottons do not assimilate together, and waste and inferior yarn will result.

The Cylindrical Cotton Bale.

We are indebted to Edward Atkinson, the well-known economist, for a communication addressed to him by the manager of the American Cotton Company, of an experiment that was made upon the round, or cylindrical, bale to test its value as a fire risk.

It appears that quite recently a bale of this kind was tested by a Board of Fire Underwriters at St. Louis, to ascertain whether it was non-combustible or otherwise, with most favorable results. The manager writes that the test was a very severe one, his statement being that the bale that was tested was placed upon supports several inches above the ground, the ends being laid bare, and wood and kindling piled under, around and on it. This was done after he had cut deeply into the bale, to show that a sample could be drawn. The latter was done to correct some objections. In order to add to its combustibility, if possible, coal oil was poured over the bale and fire set to the material. After twenty minutes the fire died down and the bale was examined with a result that beneath the outer layers the cotton was untouched, and the fire had not penetrated the ends of the bale, simply charring the exposed portions slightly. Meanwhile, another bale of similar character was shown with an iron rope run throught it and properly supported, and then unwound clear down to the core, the laps rolling off like a roll of paper in the modern printing press, delivering the cotton in a smooth, regular bat ready for the machinery. The fire bale was afterwards returned to its former position to show that water would not penetrate it, and it was found that with the unrolling of a single lap, that under the first lap the cotton was perfectly dry and not damaged in any manner. The bale was then recovered, weighed, and found that it had lost eleven pounds.

Twilling.

A Study of the Subdivisions.

In the construction of curved twills we have a combination of 45°, 63°, 27° and 70° twills in one design. A number of threads are used in forming one kind of twill, and then another grading of the same twill is used, continuing in this manner until the desired effect is produced.

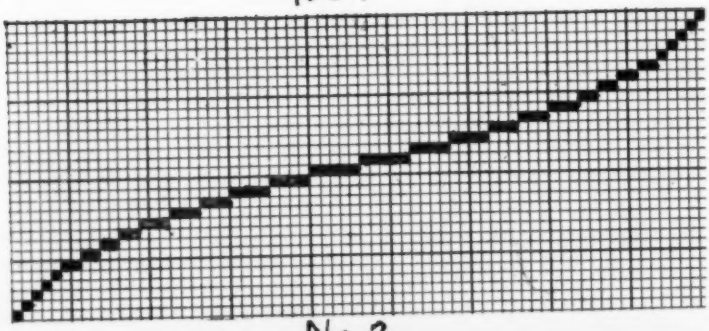
Let Fig 1 represent the curve to be introduced into our fabric. By adding in the weave to conform with the curve, we have the effect at Fig. 2. Any kind of fancy twill may be used as a base weave, though care must be taken to arrange the gradings in such a manner that the outline of the curve shall be conformable to the sample design.

At Fig. 3 we have a combination of gradings, which show a steeper effect. The base pattern is the $\frac{5}{2}\ \frac{1}{2}$ and the grading of the threads to form the weave is as follows: 8 threads 45°, 8 threads 63°, 4 threads 45°, 4 threads 63°. This is repeated twice, the entire effect comprising 48 threads.

One good point connected with this division of the twills, is that they can usually be crossdrawn on a small number of shafts. This enables the designer to introduce other weaves in combination with them, without, at the same time, exceeding the harness capacity of the head motion. At this point we may profitably consider the method employed when crossdrawing a weave for the purpose of reducing the same to its lowest number of harness frames.

As an illustration of this, let us take the weave at Fig. 3. The design occupies 48 spaces. This, on a straight

No 1



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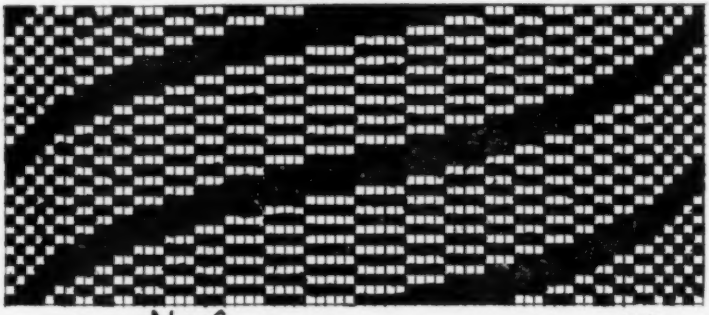

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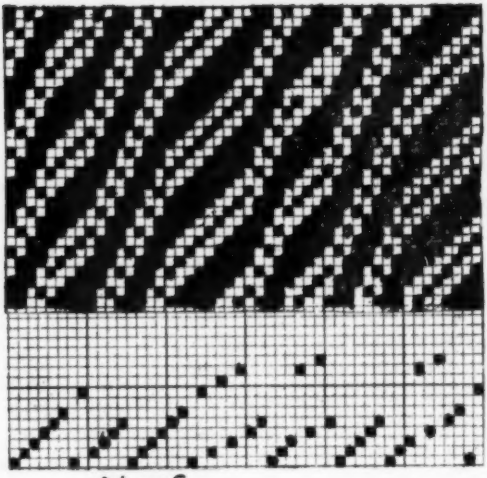

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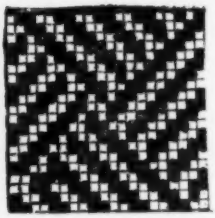

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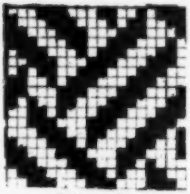

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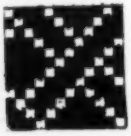

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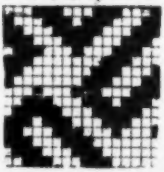


draw, would require 48 frames, using a frame for each thread, to give the desired effect; but looking carefully over the weave, we find some of the threads work alike in different parts of the design, being raised or depressed on the same picks, hence we may draft all such threads on the same shaft. The principle underlying all crossdrawing being "all threads which rise and fall alike throughout the entire weave, may be drawn on the same harness frame."

Reading from left to right of the design, we place all threads on number one space which correspond with the risers and sinkers of that particular thread, reading up from the bottom of the weave. Number two thread is found to be working differently, hence we require an additional shaft (number two), and all threads found to correspond with number two are placed upon the second shaft. This method is followed until a place has been found for each and every thread. The result is a drawing plan of the weave reduced to its lowest number of harness frames.

Before concluding this question of crossdrawing, it may be stated that it is not always advisable to reduce a draft to its lowest possible point. If too many harnesses are crowded on any particular shaft, the result is invariably bad weaving, imperfections and loss of product. The threads should always have a proper amount of working space. When harnesses are crowded together, an undue amount of friction is placed upon the yarn; and this question of friction is one that requires particular attention where fine and tender yarns are being used. Therefore, when dealing with a cross-draft in which it is found that a large portion of the threads are working alike, it may often be advisable to draft such threads on two shafts instead of one, in order to insure good weaving.

At Fig. 4 we have a class of twills from which many excellent and varied effects may be constructed. They are known as entwining twills. The lines of the twills are arranged to run at right angles to each other, ceasing as they approach each other, so as to form a clear connecting spot between the two effects. Our first example in this division (Fig. 4) is constructed from the $\frac{2}{2}$ twill. Five lines of twills intersect a like number at right angles, 20 threads and picks form a repeat of the weave, and this number of harness would be required to produce the effect. By multiplying the twill used by the number of lines of twill, we have, as a result, the required number of frames. Thus $\frac{2}{2}$ twill$=4\times5$ lines of twill$=20$ harness required.

Fig. 5 illustrates a weave with three pieces of twills. In this case the $\frac{3}{3}$ twill is the weave used, therefore $6\times3=18$ frames are required in its production.

Another method of constructing entwining twills is that of forming squares surrounded by twill lines, the squares being used to introduce basket effects, spots, or other twill effects. A design to illustrate this class is given at Fig. 6. Large and varied effects may be produced by following the method outlined. Instead of one main twill line, we may have two or three when drafting more elaborate effects.

At Fig. 7 we have an effect which is constructed by following the rule given for the first division. The blocks of twill are (made) drafted to cross each other at right angles. By introducing the plain weave in the white spaces, the effect in the fabric would be clearly defined.

LENO.

The Manufacture of Fine Yarns.

HERBERT E. WALMSLEY.

Continued from January.

Coming to the self-acting mules, the chief difficulty when spinning fine numbers, is slack winding. "Snarls" and "kinks" are a fatal defect. All spinners or winders are prone to slack winding. As the spinner on fine work is far from over-taxed, he should be

made to watch his winding all the time. The spinning master, however, should be held primarily responsible for bad work at the mules, unless in exceptional cases. Not one set of cops should ever, under any circumstances, be allowed to pass out of the mule room, until it has been examined by the spinning master, whose signature should be affixed to the ticket going with every doff. There should be a proper system of collecting all bad ends at frames and mules, and each pair of mules should be supplied with rovings from certain frames, so that all bad work may be traced to its source. As to the sizing of the yarn a certain number of cops should be sized each day. Single leas should be weighed, to find out the regularity of the yarn, and each lea tested for strength. The results should be entered in a book, to be submitted to the manager every day. Every three months samples of the best spinnings of other makers should be examined.

Spinning say 250s to 350s, on self-actor mules, the following process has to be gone through and may be taken as a basis on which to proceed in the spinning of all fine yarns. In the first place the cotton must be of good class of really Sea Islands, not Florida or Fiji. It should be pulled open by hand first, then opened by one porcupine cylinder running about the usual speed for Sea Island, and then passed by one single scutcher, with the two-bladed beater running at about 900 revolutions.

On this finishing machine a lap will be made weighing 8-10 ounces a yard. Care must be taken that the inside of the machines are thoroughly cleaned and free from rough places, and the feed rollers must be set full clear of the teeth of the porcupine or the blade of the beater. Then in the carding the card cylinder, if 50 inches diameter, should run from 130 to 135 revolutions a minute, not more, and the card must not be expected to produce more than 70 to 80 pounds a week of 55 hours. The stripping and grinding must be carefully attended to, and it is important to see that no more short fibre and dirt go forward than can be helped. The weight of the sliver coming off the card will be 15 grains a yard, and the card should make 7 1-2 per cent. of waste. The draft of the card must be much more than for 150s to 200s, and the flats should be two inches wide. There should be two feed rollers instead of the dish feed, and no licker-in. The sliver is made into a lap in the ordinary way by passing through the sliver lap machine and ribbon lapper, and placed behind the first comber; naturally this comber will require regulating and setting for the length of the Sea Island staple, and ought not to run more than 60 nips a minute. The first comber should take out 15 per cent. of waste, making a sliver of 20 grains a yard. The sliver made into a lap again and placed behind the second comber, which with the same setting and speed should produce 7 per cent. of waste, and make a sliver of about 20 grains a yard. It is necessary to run fine tissue paper through the sliver lap machine and ribbon lap laps the second time the cotton is passed through these machines. This simple device will be found effective in preventing "licking." When 150s are passed it often becomes necessary to double comb the cotton in order to have as clean and even a roving as possible for working in the mule. With the double combing begins the principle trouble, inasmuch as the fibres in the sliver being parallel, have lost, to a great extent, their hold on each other and the slightest shock or strain is liable to break the sliver; furthermore, although the sliver might not be broken, it is often stretched, making an irregular yarn. There are three passages of draw frames with eight ends up, 7 34-draft, making a sliver of 24 grains a yard. For the class of cotton spoken of the front and second top rollers should be set 1 7-8 inches apart and the top roller should not be less than 1 1-2 inches in diameter. Cans with spring

bottoms are required to assist the sliver to mount, and the greatest care must be taken that the passage of the sliver is not obstructed by anything rough or moist. With this double combed cotton everything is so delicate that it has been found that the mere passing of the hand over a polished plate is sufficient to prevent the cotton passing. All polished work should be re-polished with flour emery or rouge and maintained constantly perfect. Coming from the draw frame the sliver, again in spring bottom cans, is placed behind the slubbing frame which must be provided with a large japanned or brass roller, to help lift the sliver out of the can in the passage to the rollers. The rollers are set 1 13-16 inches from front to middle. They have large top rollers, the front being 1 5-8 inches diameter. The sliver made will be a two hank; the spindle makes 3 1-4 turns for one of the front roller. Before using the flyers they must be thoroughly cleaned inside, and polished perfectly by drawing soft, untwisted bands with flour emery and subsequently rouge. The cotton becomes highly electrical and will stick in an astonishing way to any surface that gives it the slightest excuse. The intermediate is two ends into one and makes a 5 1-2 hank front roller 1 1-4 inches diameter; the spindles make 4 1-4 turns for one of the front roller. The rover doubles two ends into one and makes a 15 hank; front roller being 1 1-4 inches diameter, the spindles making seven turns for one of the front roller.

The jack frame is with soft bobbin flyers, with, say, six-inch lift, but for the very fine work five-inch is better, doubling the two into one will make a 40-hank roving; the front roller 1 1-4 inches diameter, the spindles making 15 turns for one of the front roller. A 30 to 35-hank roving should be used for 200s, and any roving finer than 30 hank up should always be soft bobbin. In all the fly frames the great attention must be paid to the smoothness of the rollers, flyers and traverses, and on the jack frame the bobbin must be as light as is consistent with the strength required. It is also well to put paper tubes on the jack bobbins, by which means less twist may be put in this very fine hank roving. The skewers on all the frames and in the mule creels must be minutely examined, to ascertain that there is no unnecessary friction on the pivot, and any bad pot steps should immediately be changed, as also any defective skewers. The roving rod and the traverse guides, back and middle, also require special attention on account of the tendency of this double combed cotton to twist and catch. Coming to the mule, as the cops made are small, the spindle is made to correspond.

Removing Oil Stains.

In our December number there appeared an article on this subject, of much value.

During the process of spinning cotton yarns and weaving cotton cloth, it frequently happens that drops of oil from the machinery fall on to the fabric and produce stains which are most difficult to eliminate. These oil stains cannot be removed by washing with soap, and in some cases even mopping with benzine, which is the usual method adopted, has little or no permanent effect, and bleaching the material only confirms the stains and shows them up more distinctly. A writer in an English exchange proposes to remove the oil stains by immersing the stained yarns or fabric in a liquid which is capable of dissolving the oil in the stains. The liquid is composed of the following ingredients:

10 to 15 gallons of water.
8 lb. of soap.
4 " of ammonia alkali or soda ash.
2 " of ammonia extract of soap.
1 pint of oil.

The soap used may be linseed oil soap, olive oil soap, or ordinary black or soft soap. The oil used may, according to the nature of the stains, be

shale oil, or paraffin oil, rosin oil, aniline oil, crude aniline oil, toluidine oil, phenol oil, or the chemical equivalent of these oils, or combinations of them. The proportions may be altered to suit different requirements. Aniline, phenol, or toluidine oil is specially applicable when the stains are produced by mineral oil. The yarn or cloth is immersed in the liquid for from five to twelve hours, and the treatment not only frees it from oil stains, but it improves the surface and finish of the material.

Competition in the East.

It is interesting at the moment to glance at the position of affairs in India and the Far East, which have been brought about by the opening-up of China, consequent upon the carrying out of the stipulations imposed by the Shimonoseki Treaty. As will be remembered, the ratification of the treaty was immediately followed by the springing into existence of a number of joint-stock spinning and weaving companies. Of the most prominent of these three were British, two Japanese and one German. The Japanese concerns, according to one of our foreign exchanges, have so far done little beyond floating the companies, though the four mills belonging to the British and German firms are nearly completed and will represent about 200,000 spindles. But there are half a dozen native mills already in existence and running steadily, so that the Chinese are seen to be fully alive to the lucrative business to be done, and are by no means disposed to allow foreign capital to rule the field. The Bombay spinners are feeling the effects of this competition, for whereas they used to send to Shanghai as many as 180,000 bales of yarn per annum—of the value of about $7,500,000—China now either imports yarn from Japan, or produces it herself. Japanese yarn fetches a better price in the Chinese market than does Bombay yarn—better by some 6 per cent. And yet, Japan, as an Indian contemporary points out, has to come to India for the raw material. Indian-grown cotton is taken to Japan, is there spun into yarn, exported to Shanghai, and sold in the market to Chinese at a price considerably above that fetched by the produce of similar raw material spun in Bombay and sent to China direct. No doubt a large proportion of the Japanese yarn sold in China has been spun from cotton which the spinners procured from China, and it has only been in quite recent days that Japan has had to come to India for her supplies, by reason of the comparative failure of the cotton crop in China. But this fact does not materially diminish the importance of the aspect of the question which the Indian mill-owner has to face. How is it that Japan can undersell us in a market which was, until lately, our own? That labor is cheap in Japan we all know, but it is cheap in India also; whatever the explanation may be, it is evident that now China has been aroused by the Shimonoseki Treaty to something like realization of her own needs, it is not likely that she will for any length of time be a buyer of the produce of Japanese mills. It would appear that the local mills will gradually absorb the trade in yarn, to the exclusion of Osaka as well as Bombay. However, the economical production of yarn and cloth is a subject which will now more than ever exercise the mind of the Bombay producer, for if Japan can produce one class of goods at a phenomenally low cost, when labor is a prime factor, she can produce others.

—A clean cotton does not require as much scutching as cotton possessing much more foreign matter, so where the two are mixed the scutching which is required to adequately clean the dirtier portion will be more than sufficient for the rest, and there is no doubt that the action of the scutcher beater on the cotton to a great extent permanently damages and weakens the fibre, so that it is imperative that, in scutching, this point should be borne in mind.

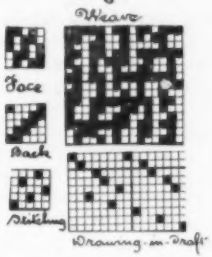
COLORED PATTERN SUPPLEMENT.

Fancy Back Covert Cloths.

[See colored pattern card insert opposite page 64.]

When any fabric has had a considerable sale, the plan of every progressive manufacturer, as soon as there is evidence of a falling off in the favor with which it is held, is to make some change in it, which, while not affecting the character of the fabric radically, serves to make it enough different to still keep it before the trade, and preserve its general liking. This is true of covert cloths, which for some seasons have had quite a sale, and are beginning to get in a measure common. But while the fabric remains popular, the trade demands a change, and this is found in the addition of a fancy back.

Fig 1.



In the fancy back cloths the same effects and colors are used in them as in the single cloths, and these shades consist of the olive browns and olive greens, and some medium shades of tan.

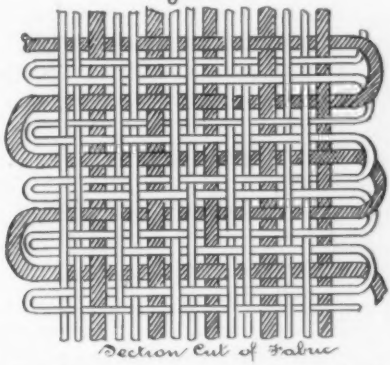
The colored samples, shown on the pattern card insert, opposite page 64, represent the general tone of shades, and it is only necessary to make three or four examples approximating these to sell a line; that is, if the price and fabric are right.

In Fig. 1, is shown the weaves for these fabrics; that marked "face," is the regular single cloth covert weave, and that marked "back" is the weave used for the fancy back cloth, both being stitched together with the weave maked "stitching," which produces the complete weave, which repeats on fifteen warp ends and fifteen picks, but by using the "drawing-in" draft shown, can be woven on ten harnesses, the front five being used for the face, and the back five for the back.

In Fig. 2, is shown an enlarged section of a fabric woven on this weave. The dressing and weaving of the face and back can readily be seen, the proportion between the two being, two face ends and two face picks, to one back end and one back pick.

The face ends should consist of a tightly spun twist; a light and a dark color composing the twist, usually an

Fig. 2.



olive brown or olive green combined with a white or light tan. The filling of the face cloth should be of the same shade as the dark color in the twist of the face warp. The back cloth threads should be made of fine stock which will give a soft cushiony feel to the fabric, and give it bulk as well as weight, as both these qualifications are required in these goods, the weight wanted being 28 to 29 ounces. The fancy backs as shown in the illustrations consist of large plaids, and the colors should always be bright.

Samples 4, 5 and 6, are of the same pattern, but different dressing, being as follows:

No. 4.

Warp.	Filling.
10 dark tan.	10 dark tan.
10 light tan.	10 light tan.
10 dark tan.	10 dark tan.
30 light tan.	30 light tan.
4 white.	4 white.
4 light tan.	4 light tan.
6 red.	6 red.
30 light tan.	30 light tan.
104 ends (1 rep't.)	104 picks (1 rep't.)

No. 5.

Dressing of Warp.	Filling.
10 white.	Same as warp.
10 light tan.	
10 white.	
30 very light tan.	
4 green.	
4 very light tan.	
6 light tan.	
30 very light tan.	
104 ends (1 repeat.)	

No. 6.

Dressing of Warp.	Filling.
10 light tan.	Same as warp.
10 light blue.	
10 light tan.	
30 very light tan.	
4 white.	
4 very light tan.	
6 red.	
30 very light tan.	
104 ends (1 repeat.)	

In sample 7, is shown one of the very best combinations, and the general tone of shade here, is the character of what is mainly wanted. The dressing and weaving is as follows:

Warp.	Filling.
8 white.	Same as warp
8 dark tan.	
8 white.	
12 dark tan.	
12 white.	
50 dark tan.	
18 white.	
6 dark chocolate.	
18 white.	
8 dark tan.	
148 ends (1 repeat.)	

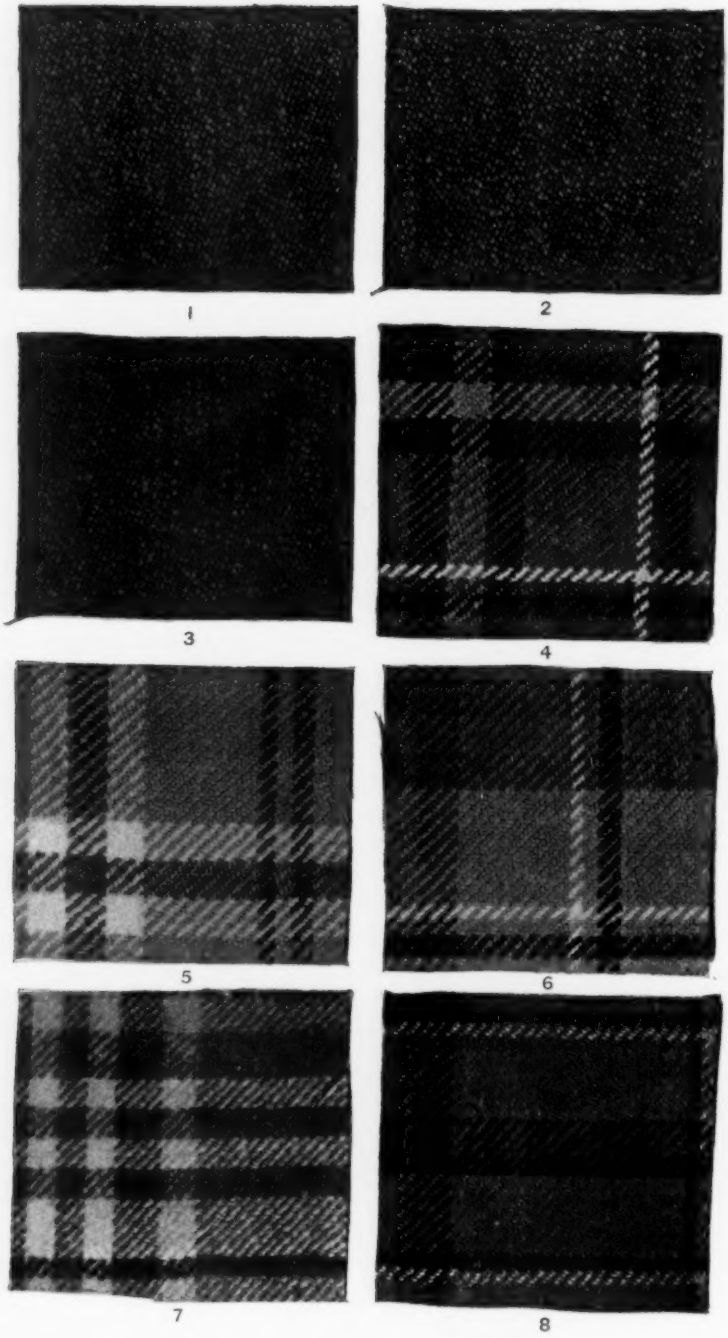
This pattern can be improved and enlivened by the use of two threads of red across the centre of the ground of the plaid.

Sample 8 is an irregular plaid, in that the filling and warp are woven and dressed differently.

Dressing of Warp.	Filling.
10 dark brown.	6 red.
6 red.	10 dark brown.
60 tan.	30 tan.
4 black.	4 white.
4 white.	4 black.
60 tan.	30 tan.
144 ends (1 rep't.)	84 picks (1 repeat.)

It should always be borne in mind that in regard to colors the warp and filling should always be the same, that is, no colors should appear in the filling which are not in the warp and vice versa. The plaids need to be balanced and square, and as much care taken with the back as with the face.

—The new tariff bill should be one which, upon woolen manufactures, should be made up almost entirely of specific duties. My observation for the last twenty years leads me to the conclusion that ad valorem rates upon woolen manufactures are productive of undervaluations, which, in my judgment, are so large, and they occur to such an extent as to almost ruin the industry in this country. The establishment in this country of houses for the express purpose of selling goods manufactured on the other side makes it almost impossible to find out the value of many goods that are sent to this country, and hence the impossibility of having a correct duty assessed thereon. It is my opinion that the 50 per cent. duty of the "Wilson Bill" is not high enough for our woolen manufacturers. At the same time, I think if that duty could be honestly collected upon the actual value of the goods, it would not be so far short of effectiveness as many people now imagine. The main point is to find this true value, and to collect the duty thereon, and as it is impossible, under existing circumstances, to do this through the machinery that has been employed in the past in our custom houses, I believe that the time has now come when this Government should think of nothing but specific duties for enforcing proper protection to our manufacturers upon these articles.—[T. C. Search, president Nal. Asso. of Mfrs.



FANCY BACKS AND COVERTS

WOOLEN DEPARTMENT.

Photographing in Textile Manufacturing.

FAULTS ASCERTAINED AND THEIR CAUSES.

BY THOMAS R. ASHENHURST.

(Concluded.)

I have so far spoken of worsted yarns only, but the same will apply to cotton or any other material; and although my practice has brought me more in contact with worsted and woolen goods, I have applied the same tests a number of times to cotton and other yarns.

I must now deal with another phase of the subject. There is probably more trouble in manufactured goods where two qualities of wool are blended in the same thread than in any other. A great deal depends on the method adopted of mixing the wools, but even of the best methods there is a liability of a large proportion of the fine wool running together in one portion of the thread and a large proportion of coarse in another; hence, irregularities in the fabric, and probably irregularities in the width of the cloth due to variation in shrinkage. In low and medium worsted coatings where crossbred wools are used, and in wool dress goods, this is especially noticeable, and consequently every care should be taken in the blending to avoid it.

What concerns me most at the present moment, however, is the method of discovering to what extent this irregularity exists in the yarn. The methods I have described would in some degree disclose it, but it is not sufficient in itself. The best plan to deal with this matter is to take portions of the thread from different bobbins and embed each in paraffin wax; then cut this section of the thread very carefully. Mount each of these sections on a microscopic slide and photograph them, and project the picture on the screen where not only can the number of fibres in each individual thread be easily counted, but the relative area also ascertained, thus discovering whether or not some portions of the yarn are composed mainly of coarse or fine fibres, and account for unevenness in the texture of the fabric. Mixed yarns of this description disclose themselves in various ways in the cloth and it is desirable that some method of discovering the causes of such defects should be at hand.

Although the faults which occur in fabrics from defective yarns are the most subtle and the most difficult to determine, yet there are others where photography may be well and profitably employed. For instance, tight or slack threads in the process of weaving. Disputes often arise as to whether certain defects are due to tight and slack threads or hard and soft twist in the warp. The determination of hard and soft twist is not difficult, especially in two-fold yarns, as the twist tester can be easily resorted to, but tight and slack threads are more difficult. There are also defects in the structure of the fabric or produced in the actual process of weaving; the causes of which it is necessary to ascertain. In such cases actual photography, not shadowgraphy, must be resorted to; although there may be special instances where shadowgraphs are most useful. For such purposes as these I prefer to work with the electric arc light of from 1000 to 3000 candles power, as this light can be better concentrated on the object than day-

light. A diffused light is of little good. With a powerful arc light it is quite easy to make photographs of absolutely black cloths and show the structure clearly on the screen. I made a photograph of a black worsted coating where the merchant complained of what he called a "cross twill" which spoiled the appearance of the cloth, and the manufacturer said he could n't alter it, as the design was correct and he could not account for the defective appearance. When photographed and shown on the screen an imperfect binding of the back to the face cloth was distinctly visible so that the cause of the trouble was easily located. Of course it may be said this could easily have been ascertained by reference to the design or by dissecting the cloth. That is quite true when you have the design at hand and know what you are looking for, but it is very different when you have simply a small piece of cloth put in your hands and have to look for an unknown cause. For this purpose I use a good arc light and my long camera. I mount my cloth on a sheet of white paper and place it in a vertical position in such manner as to get all the benefit of the concentrated light and bring out the structure in the most perfect light and shade. Then place my camera at just a sufficient distance from it to get the degree of enlargement to suit my purpose and expose in the ordinary way. To get all the detail it is best to use small stops and slow plates and give long exposure. The length of exposure depending upon the character and colors of the fabric. Only experience can guide one on this point. The only word of warning I could give would be, "don't be in a hurry," give plenty of time both to exposure and development.

In my first experiments in this direction some fifteen or sixteen years ago, I, like most beginners, made mistakes, but benefitting by them I soon found it an easy matter to obtain exactly the results I desired, and, for illustrating lectures as well as for the other purposes I have named, I found the work invaluable.

Many may ask, what about the cost of appliances, etc.? The lenses from any ordinary one-quarter plate camera placed in front of the long one I have described, any ordinary dry plates, and the usual developers, are all that is required for photographing cloths. For threads or fibres an ordinary lantern with oxyhydrogen light, or ordinary oil lamps, a micro front to take the place, or be interchangeable with the ordinary lantern front, and a screen to throw the image on, and the whole apparatus is complete.

I am so satisfied of the utility of this system, that I should not feel myself equipped unless I had this apparatus at hand so as to examine any faulty fabrics, and although I have not had occasion to practice it during the few months I have been in the United States, I am having my apparatus sent to me from England.

Chalk Talk.

FINISHING ROOM CALCULATIONS.

The calculations made necessary on account of the loss sustained in the finishing processs of woolen fabrics is the most important of the finisher's duties, and especially so when a new class of goods is to be dealt with.

It will be necessary to weigh all questions pertaining to the process with the utmost care, with a view to determine the actual loss sustained in either or all of the processes through which the fabric has to pass before it is finally finished.

The goods, as they come to the finisher from the weave room, are heavier than what they will be when finished, provided nothing is done to either retain or increase the weight; but the amount of loss consequent upon this is not the only problem with which the finisher has to deal. This is simply a

26-oz=weight per yard from loom
20%=loss in finishing
24 oz = weight per yard wanted
36 in = one yard

—— o ——

26 x .20 = 5.2 oz loss.
26 − 5.2 = 20.8 oz clean wt per yd
or 26 x .80 = 20.8 oz clean " " "

—— o ——

20.8 x 36 ÷ 24 = 31.2 " left to the yd
or by cancellation thus:

$$\div \frac{\overset{10.4}{\cancel{20.8}} \times \overset{3}{\cancel{36}}}{\underset{2}{\cancel{24}}} = 31.2$$

—— o ——

or to do all the above in one operation $\div \frac{26 \times \overset{4.2}{\cancel{84}} \times \overset{3}{\cancel{36}}}{\underset{5}{\cancel{10}} \times \underset{2}{\cancel{24}}} = 31.2$

36" − 31.2" = 4.8" to be shrunk per yd.

—— o ——

9 oz = Weight per yard from loom
15% = Loss in finishing
12 oz = Weight per yard wanted

—— o ——

9 x 15 = 1.35 oz loss. 9 − 1.35 = 7.65 oz clean weight 12 − 7.65 = 4.35 oz difference in wt 4.35 x 2 = 8.70 oz Amount of flocks to be applied

(W.

question of oil, dirt and surplus dyestuff which must be removed, leaving the fabric clean.

It is from the clean weight of the fabric that all future calculations must be made. To this is to be added the loss sustained in the fulling, which is the largest loss the fabric has to bear in the entire process. Aside from the amount of dirt, grease and other foreign matter which is loosened here, but not removed, there is a large loss due to the wear and tear of the process. How large this loss is may be tested by taking a piece, well scoured and cleansed, and then full it in a perfectly clean mill. When the process is completed it will be found that quite an amount of stock has accumulated on all projections, as well as at the bottom of the mill. This loss takes place under any and all circumstances, and cannot well be avoided, no matter how well the goods are lubricated with soap.

If goods are allowed to run dry, this loss is considerably larger than it will be if goods are properly soaped, and here is where the finisher's calculations may be easily knocked in the head.

If the finisher provides for a certain per cent. of loss here, and sustains double, the goods are sure to be light, even if the shrinkage is correct.

In the washer all foreign matter is removed, whether done before or after fulling, and the two processes properly come under one head.

The loss sustained in the gigging also is quite large, though not so great as that of the fulling, and finally the shearing brings another loss.

It matters not where the loss occurs, it must be taken into consideration before the goods are put into the mill. As said before, all calculations must be based upon the clean fabric, but all the subsequent losses must be considered in the same light as impurities of the goods, and when figuring from the clean fabric to obtain the required weight, these things are then included.

To arrive at a correct conclusion in this respect is quite a serious labor, and therefore the finisher must have recourse to experience, which is the best teacher, to estimate the amount of loss sustained in the process, and then figure from that.

When one set has been finished it is easily determined whether the calculations have been correct or not.

One yard should form the basis for all calculations, for then it will be easy to see if the work is progressing as it should, by marking off one yard at the end of the cut.

Take, for example, a piece of heavy weight cassimere, to finish 24 ounces. The goods come from the weave room weighing 26 ounces; estimate the loss entailed by the operation to be 20 per cent. Figure as follows: 20 per cent. of 26 ounces equals 5.2 ounces, and taking this from the gross weight would leave 20.8 ounces as the clean weight.

To find how much one yard or 36 inches must be shrunk to weigh 24 ounces, multiply the clean weight by the inches, or 20.8×36, and divide by the weight wanted, 24; this gives the number of inches the yard ought to be when shrunk, thus: $20.8 \times 36 \div 24 = 31.2$.

So one yard has to be shrunk to 31.2 inches, or in other words, 4.8 inches per yard.

To make the whole thing simpler, make one example of the two, that is, first find the clean weight, and then find the shrinkage:

$$\frac{26 \times 80 \times 36}{100 \times 24} = 31.2$$

This is by far the preferred method, as it is considerably less work.

The following rules govern the various proceedings:

1st. To find amount of loss, multiply the per cent. of loss expressed decimally by the gross weight.

2nd. To find clean weight subtract amount of loss from gross weight.

3rd. To find shrinkage required, multiply clean weight by inches in yard

(36), and divide by weight wanted, and subtract the result from 36 inches.

To perform all these operations at once, proceed thus: Multiply the gross weight by the clean weight expressed decimally (.80), and this by the inches in a yard (36), and divide by 100, multiplied by the weight wanted.

The foregoing examples cover only goods where the shrinkage alone is depended upon to make weight, but this is the smallest and easiest part of the calculations required in finishing.

For the next example, the other extreme of cloth which neither shrinks nor stretches, and where the loss sustained has to be made up by flocks, will be taken.

As these are usually cotton warp fabrics, and are woven lighter than they ought to finish, it is necessary to take into consideration that the warp does not loose much of any, but the filling partly makes up for this.

For instance, take a piece of 3-4 union cassimere weighing from loom 9 ounces, to finish 12 ounces per yard. The goods lose 15 per cent., loss to be made up by flocks.

The clean weight of the goods according to this is obtained thus: $9 \times .15 = 1.35$; subtract this from gross weight, thus: $9 - 1.35 = 7.65$. Thus one yard only weighs 7.65, which, subtracted from 12 ounces, the finished weight wanted, leaves 4.35 ounces, to be made up by flocks. Unless the flocks are exceptionally good not more than half will go on the goods, and thus it is necessary to apply double the quantity to have the goods come out right, which would give 8.70 ounces per yard, or better, 8 3-4 ounces.

RULE: Multiply gross weight by per cent. of loss, decimally expressed, and subtract result from gross weight. Subtract this result from weight wanted and multiply by 2.

—Many works are often carried on in the hope of better times coming, and simply to keep the concern together.

Ideas for Dress Goods.

The following weaves for ladies' spring and summer dress goods will produce many neat effects by changing the colors. No. 1 is a neat check effect in worsted, made by figured effects on the plain, or cotton, weave, and by arranging the colors so as to form a small check. The layout for No. 1 is 66 ends and 60 picks per inch; the number of ends in the warp will be controlled by the width wanted, and weight will indicate the counts of yarn. Dress as follows:

4 times { 2 dark blue, 1 white, 1 light brown and pale blue twist, 1 white

11 ends in pattern.

Filling same as warp. Start to dress and weave the warp as indicated in the chain draft. Straight draw on 22 harnesses; 22 bars.

Pattern No. 2 is another fine worsted design, 70 ends, 70 picks per inch. Dress as follows:

2 times {

2 black	2 black
2 rose	2 rose
2 white	2 white
2 drab	2 drab
2 black	2 black
2 drab	2 drab
2 white	4 rose pink silk
2 rose	

48 ends of warp in a pattern.

The filling is 2 of white, 2 of brown, the colors to go in as indicated in the chain draft, making a handsome line or fine stripe, drawn straight on 8 harnesses.

Pattern No. 3 is composed of coarser yarns, with a soft open weave, slack twisted yarns, 36 warp ends, 36 filling picks per inch, dressed as follows:

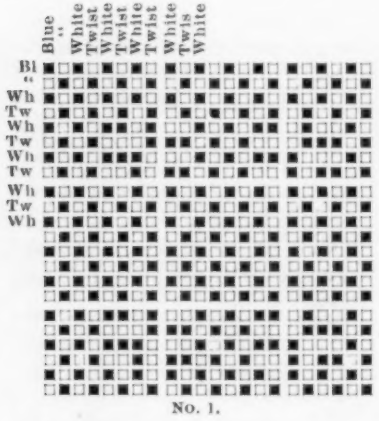
1 seal brown
1 pink and white
1 white

3 ends in pattern—filling, white.

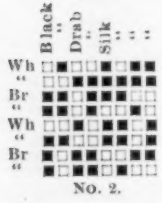
The pink and white is composed of two threads of printed yarn twisted together. We can bring out novel effects

in this design by using silk noils in different shades; also by putting in colors in the filling.

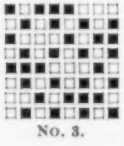
Anyone can find the ends in the warp by multiplying the ends per inch by the width desired, and regulate the weight by the size of yarn. When one set of ends is found, we can use the rule of three when changing from one width to another. For example, say we wish to change the latter pattern from 36 inches to 50 inches, how many more ends required? We would have in 36 inches 1296 ends, how many in 50? 36 : 50 : : 1296 : X = 1800.



No. 1.



No. 2.



No. 3.

When we know the number of ends per inch, we may multiply by the width per inch and we get the result, but sometimes the ends in a warp will not divide evenly; then, to save fractions, we can use the rule of three, as above. This, coupled with cancellation, saves much time in many problems of this kind. We can also use the rule of three in computing the change in weight if a 36-inch goods. Should the latter weigh 5 ounces per yard, what will a 50-inch piece weigh, of the same construction. Example: 36 : 50 : : 5 : X = 6.94.

EXPERIENCE.

A Wool Exchange.

An attempt is being made to organize a wool exchange in New York. Such efforts have been made in former years, and at one time, in the seventies, a movement towards it was more or less successful, though a private enterprise, in which lots of wool were put up and sold at auction. It is doubtful of the success of such an enterprise as is proposed; yet, under proper organization, it might be made a feasible undertaking, if supported by the trade of New York and elsewhere. Apparently, there may be no reason why it should not prove fairly successful, as in London, though on a smaller scale. It is the opinion of some who favor the scheme, that no trading in futures would be allowed, as being impracticable on account of the great variations in wool, and the difference in the amount of shrinkage in them of the same grade. This objection is a plausible one; still, it is possible to deal in wool futures after the plan adopted in the sale of cotton futures. Such a thing as this is done at Havre, concerning wool from Argentina; still, operations of this kind in wool have more to encounter than those relating to cotton.

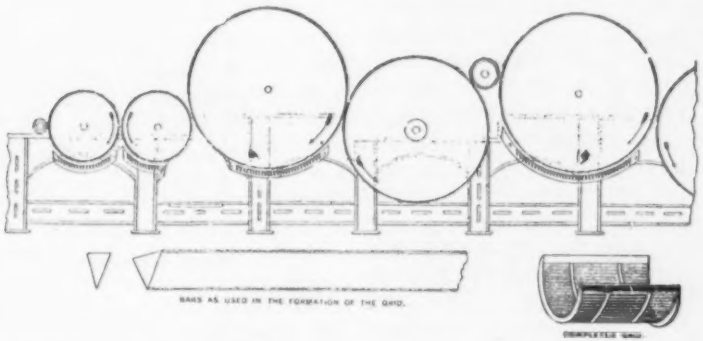
—Russia, which occupies the first rank in Europe as a producer of wool, possesses 45,000,000 ordinary and 15,000,000 merino sheep, chiefly in the south, thanks to the extensive pasturage and temperate climate, which permits of keeping the flocks out in the fields during most of the year. The annual production of wool amounts to about 10,000,000 poods (178,457 tons), giving six pounds of wool to each sheep. Spinning mills in the governments of Moscow and St. Petersburg numbered 68, in 1885, occupying 4789 workers, and producing a value of more than 5,000,000 roubles ($4,000,000).

Undergrids for Carding Machines.

We herewith illustrate undergrids for worsted, woolen and cotton cards, manufactured by the White & Rushton Co., 38 River St., Providence, R. I. It requires but very little description in connection with this illustration to give the manufacturer an idea of the functions of these grids. The placing of devices of this kind under carding cylinders is not entirely new, but has been practiced for many years in a more or less unskillful manner, and has always proved unsatisfactory, excepting when certain kinds of stock were employed. The plea has been that what drops under cards properly belongs there as waste, though oftentimes in a condition for renovation and future use. This device, however, has something more substantial concerning its merits than anything that has preceeded it, and is entitled to the consideration of manufacturers, when economy of production is of vital consequence. If grids have been objectionable, it has been largely due to the form of their construction. Any objections that may have been raised against their use, heretofore, cannot be entertained, as far as we can learn, against the one we here illustrate. The grids made by this company, as will be seen by reference to the illustration, are fixed below the swift's breast and lickerings of a carding engine, and when so fixed they are the means of affecting a great saving of both time and money, by preventing the dropping of good fibre, and at the same time expelling all dirt, hard lumps, bits of skin, etc.

This company has supplied and completely fitted up some of the largest mills in England, France and Belgium, as well as some of the best known mills in the United States, taking the place of screens, rollers, etc., to which we had particular reference in our above remarks on the former use of similar devices. The following advantages are claimed over anything that has been tried for this purpose:

1st. The grids are so constructed that they do not interfere in any way with the dirt and seeds which are at present thrown down from the point of contact between the cylinder and doffer.



BARS AS USED IN THE FORMATION OF THE GRID.

2nd. The bars in the grid are made at such an angle that the cylinder, as it revolves over the bars, creates a certain amount of draught, which has a tendency to loosen and bring down to the floor, any seeds, etc., that may still remain in the wire of the cylinder.

3rd. Not making any grids to stock, but guaranteeing every grid to be made a perfect fit for the cylinder it has to work upon, and all grids being fixed by the company's own experienced fitters, within one-eighth of an inch of the cylinder, it is easily seen that it would be impossible for any stock to accumulate between the cylinder and grids.

Useful Calculations.

CALCULATING ON THE REED.

If the warp has 2600 threads, the method of ascertaining the required reed to weave it 74 inches wide in the loom is as follows: $2600 \div 74 = 35$ threads to one inch. If there are 35 threads to one inch, it is necessary to proportion them equally in a reed containing a number of splits or dents, which will correctly divide into 35. In this case 5 will divide equally into 35. Thus $35 \div 5 = 7$. Therefore, a No. 7 reed, with 5 threads in each dent, will spread out the warp to a width equal to 74 inches in the loom.

LAY OUT OF THE YARN.

A fancy woolen cloth is at hand. It is ascertained by "picking out" that the threads of which it is composed are as follows:

24 threads of black yarn.
8 threads of drab yarn.
2 threads of brown twist.
8 threads of drab yarn.
24 threads of black yarn.
2 threads of drab twist.
68 threads in the pattern.

The number of patterns comprising the full width of the fabric is found to be 40. Hence, $40 \times 68 \times 2720$. Next we find by proportionating this figure that it is equal to

2400 threads of black yarn.
300 threads of drab yarn.
10 threads of brown twist.
10 threads of drab twist.

Proof, 2720 in whole warp.

To proportionate, multiply the number of threads by the width of inches of the fabric.

Next ascertain what number of threads can most conveniently be used on a certain number of spools by dividing the number of threads of each color by the number of sections which we will call 10.

DIVIDED BY 10 SECTIONS.

2400 black = 240 threads for one section.
300 drab = 30 threads for one section.
10 brown = 1 thread for one section.
10 drab = 1 thread for one section.

272

Next, to ascertain how many spools of each color are needed to form the pattern: By dividing the subdivided proportions of the whole warp by the number of threads in each spool, which is 40.

DIVIDED BY 40.

240 threads of black are equal to . . . 6 spools.
30 threads of drab are equal to . . . $\frac{3}{4}$ spools.
1 thread of brown is equal to . . . $\frac{1}{40}$ spools.
1 thread of drab is equal to . . . $\frac{1}{40}$ spools.

$6\frac{22}{40}$ "

40

Proof, 272

Tie in at the dresser as follows:

24 threads of black.
8 threads of drab.
2 threads of brown twist.
8 threads of drab.
24 threads of black.
2 threads of drab twist.
68 threads in one pattern.
40 pattern in the whole warp.

Proof, 2720.

Sheep Husbandry.

The tendency in sheep husbandry in the United States is towards the raising of sheep more for mutton than for wool alone. This becomes more noticeable as the country increases in population. It would be the height of folly to attempt the raising of merino-wool sheep in New England, except for breeding purposes; but, on the other hand, it would be a piece of the greatest economy if attention were given to the raising of the mutton breeds, in which wool would be a secondary product. In fact, no farmer can really afford to operate his farm without sheep. It is an animal that nearly pays for itself in the bringing up of waste places and making them fertile. The United States will always raise sheep in large quantities, whether there is a protective

tariff on the wool or not, but it will not be the purely merino. In order that the wool product may be a desirable one, much attention is being given to the Rambouillet, or French, type of sheep, which is not only a good mutton, but also a good wool sheep, producing a merino wool. It is a large sheep, as will be seen in the accounts given in agricultural papers of this breed at county and state fairs. This breed will weigh, under proper care and selection, 100 or more pounds at five months of age, and fully two hundred pounds at thirteen months of age. An excellent cross upon the common merino is the Lincoln breed. It is popular in all wool growing countries, and particularly so in Australia and the Argentina.

Not in Favor of High Duties.

The American Sheep Breeder, of Chicago, is a representative wool-growers' journal, and is not in favor of a 12 cent duty on wool with a yearly increase of half a cent per pound until the tax becomes prohibitive, as was urged the other day before the Ways and Means Committee by Judge Lawrence and others. "This radical and irrational nonsense," it says, "was unanimously voted down a year ago, at the Washington meeting of wool growers and wool dealers, and should never have been heard of again, but somehow or other it got into the so-called wool growers' 'memorial' to Congress, and bobbed up before the committee on the 6th of January, to the digust of the committee and everybody else interested in a reasonable, practical and permanent wool tariff. And the worst feature of the occasion was that it was presented under the guise of authority as the will and pleasure of American wool growers. On the contrary, nothing is further from the truth than such an authoritative statement from the wool growers of the country. Several Montana associations, state and local, have asked for a 10 cent specific duty; South Dakota wool growers are twice on record for a 6 cent flat duty; Michigan growers have lately expressed preference for the old McKinley law. A score of other associations are on record for from 8 to 10 cent duties, and thousands of individual sheepmen have expressed preferences for all the way from 5 to 12 cents per pound."

—The Philadelphia Museums, Philadelphia, are receiving considerable attention from manufacturers, and others desiring to obtain information concerning the possibility of establishing an export trade between the United States and foreign countries. The scheme is no longer an experiment, but a useful agent in extending trade. It is not a local institution, but a national one; and, more than that, it may be denominated international. It shows manufacturers where they may find trade, better than any private effort could possibly do, and at a less expense. It shows what is being sold in foreign markets, giving samples, prices, and the necessary information. The work of the Museums has already demonstrated its usefulness to its subscribers and correspondents. Those who are not already familiar with the Museums, we should advise to at once place themselves in correspondence with the director, Dr. W. P. Wilson.

—The exportation of English textile machinery to the United States is on the steady increase. For the first eleven months of 1896 the exportations amounted in value to $2,800,000, an increase of over 30 per cent. over those of 1995. The increase over the exports of 1894, for the same period, was over 134 per cent. But this increase in the exportation of English machinery is not confined to the United States, by any means, but applies to all manufacturing countries in Europe, India, Japan and elsewhere. These exportations for the full year of 1896 will probably show a value of $35,000,000, against $25,000,000, two years ago.

KNITTING DEPARTMENT.

The Knit Goods Situation.

A pilgrimage through the knit-goods district of New York City does not in a single instance reveal the materialization of the hoped-for improvement in trade, according to which most manufacturers scheduled their plans for 1897. And yet they are all cheerful, if not chipper. In a few cases, in spite of hope long deferred, they are more confident than ever.

The manager of the hosiery department of one of the largest houses in the world, who a month ago said he expected to see a decided improvement in business, but not before March or April, now says he looks for nothing less than a boom at that time. Why? Because, he says, the majority of people are simply overgrown children. With a special session of Congress and the certainty of a duty on raw materials, he is willing to wager a scramble on the part of consumers and buyers, that, in the course of two or three weeks, will make present values seem a dream of the past. Within a week, I have talked with twenty-six knit-goods men, some manufacturers, some traveling salesmen, some resident agents, and every one of them has expressed the opinion that it will be several years before the standard staples are again quoted at anything like present prices. The market is overflowing with staples, as is natural after a long period of depression, and there is much hesitation in offering fancies. The result is that drummers for established fancy lines are about the only men out whose recent trade has been even fairly satisfactory, allowing for the "hard times." Some of the biggest houses in the trade, with reputations to sustain, are complaining bitterly over the price cutting on staples made by concerns of lesser calibre, which cannot fill their contracts except at a loss. Many of these contracts, it is said, were not made in good faith and will not be filled more than in part, yet they serve as rams with which to batter quotations made by trustworthy companies and firms. Aside from piece cutting on staples, the most troublesome factor just now is the matter of credits, which are so difficult to judge of as to eliminate the narrow margin of profits. Many concerns which are ordinarily close collectors, are pushing their customers very little these days, being fearful of results. I have yet to meet a man in the trade who does not expect to see a tariff on raw materials passed within a few months. The chance for shaving on raw materials, it is argued, has furnished about the only incentive for price cutting, and therefore such a measure will be hailed with loud acclaim. As the public runs from one extreme to another, there is a general feeling that there will before long be a decided movement toward fancy stuffs of all sorts. The zipping cold snap which rounded out January, has already made itself felt by cleaning out lines which jobbers were sure would have to be carried over to next season. If some of the smaller western concerns get anything like the duplicate orders they are expecting, they stand well to have a fair season; if they do not, it is safe to say a grist of the weaker ones will be shaken out of business before another twelvemonth rolls around. That is what it is fast coming to, anyhow—the survival of the fittest. Not many new concerns have sprung up within a year or two, but during the boom of four years ago, when many

factories were running day and night, a lot of firms gained a foothold for which there is no field under normal conditions. Many of these bid fair to be wiped out. The poverty of the masses, indeed, of almost everybody, is conconceded to be the great underlying preventive of the revival of demand. Idle operatives do not wear out knit goods nearly as fast as busy workmen, but beyond this the positive inability of many people to buy is causing them to patch and mend in a fashion they would scorn to do in ordinary times. The trade generally thinks that confidence will be immeasurably increased by the imposition of duties sufficient to defray the expenses of the government. Then with three years of plain political sailing ahead, and the big balance of trade in favor of this country, prosperity is inevitable.

The selling agent of a big hosiery concern expresses the situation in a senteuce when he says "the wishbone has been broken further up." It's a waiting market; there are no stocks, and some one is going to get left. Who will it be? The fun is bound to begin; the only question is, when?

Points on Winding.

Place winding machinery near the knitters. The custom of having the winding in a basement, attic or some apartment far from the knitting room, makes it necessary to do a great deal of carrying stock, resulting, of course, in extra labor. But the chief gain when the winding and knitting are close together is that unnecessary handling of the yarn is avoided. When the winding department is some distance away, the bobbins must be handled twice over, causing unravelling, softening of the cops, etc. If the winding is close by, however, the winder can place the yarn near the knitting machine, where it can be taken as used with only one handling.

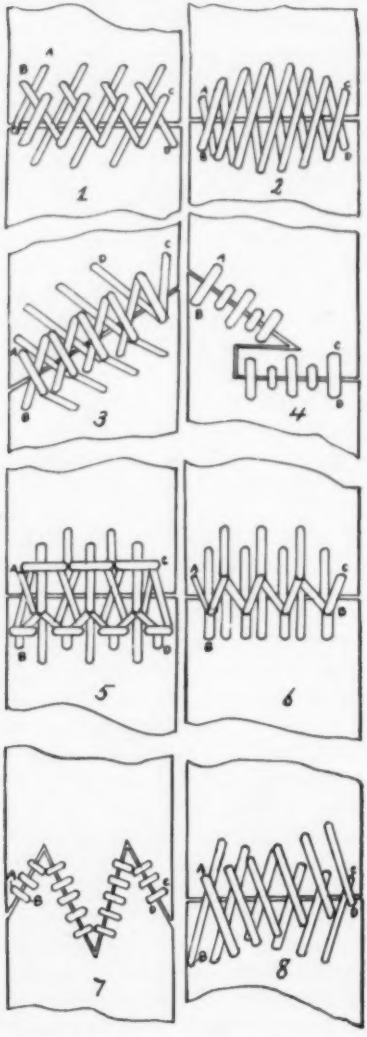
This matter of handling cops of knitting yarn is of more importance than some manufacturers suppose. Take a bobbin of yarn in which the cop is of the shorter pattern. Perhaps some of the yarn has been wound a number of turns beyond the end of the cop. So long as the bobbin is kept straight no harm follows, as the yarn will maintain its position and can be adjusted correctly upon the spindle of the knitting machine. If the bobbin is slightly bent during handling, however, the point of the spindle will cut into the top layers of yarn and be productive of considerable waste. Careful handling of bobbins is a first point to teach.

Of the parts of the mechanism of the winder that call for special notice, is that which pertains to the guiding of the yarn upon the cop. No matter how good the winder may be, or its attendant, poor work will be done if the thread guides are out of order. Usually the heart-cam system of vibrating the guide is employed. The aim should be to make each layer of yarn overlap the previous one in such way that the new thread shall not mount the cop beyond. When this occurs, trouble occurs in knitting the yarn off, as the last rows of yarns will in each case be below the previous, and the latter will be partly pulled off before their time. "Drag" must be looked out for. Most American knitting machines wind the yarn off over the noses of the bobbins, and if the yarn has been adjusted so as to interlap with alternate rows, the drag occasioned will chaff the threads, and at times produce a snarl.

Do not try to get too much yarn upon the end of a bobbin. Full bobbins are advisable, but the amount of waste created by overloaded noses of bobbins, in some mills, is enough to discourage the attempt to make large bobbins of yarn even if the knitters desire them. A firmly wound, compact and evenly adjusted bobbin is always the best, even if it be a trifle small as regards the number of yards of yarn upon it.

Belts for winding and general knit-

ting machinery are ordinarily narrow, light and high speeded. In some instances the belts must take short turns around sharp angles. In others, the belt passes from the floor above or below, so that a single line of shaft may serve the driving of machinery on two



or more floors. Again, the requirements in some cases are for very narrow belts, and at the same time considerable work may be required of them. These facts, combined with the great speed at which some styles of belt-drives must operate on certain makes of winding and knitting machinery, compels the use of special types of belt sewings. Some of these kinds, which are a little out of the ordinary run, and at the same time proven to be practical, are exhibited in the diagram, in which style No. 1 shows a double cross system, which can be made by starting the lace at *A*, crossing and returning to *B*, from whence the rest can be followed by observing the plan, ending at *C* and *D*. A sewing that is good for high speed and narrow belt is shown in No. 2. To make, begin at *A* and *B* with single lace, and end at *C* and *D*.

If a belt union bothers by breaking often, increase the sewing surface by making a diagonal cut, as shown in No. 3; commence to lace at *A* and *B*, and finish at *D* and *C*. A peculiar style of union is presented in sample 4, consisting in dove-tailing the butts, thus assuring great firmness. To lace, begin at *A*, go to *C*, and onward as indicated, completing at *C* and *D*. But little lace leather is required for this style of union.

A rather complicated yet effective sort of lacing is illustrated in specimen 5, which can be sewed by starting at *A* with a double lace, going to *B*, thence following out the order presented, ending at *C* and *D*. This style is commendable for a belt that has to make several sharp turns each run. In sample 6 is a type of lacing that will do for general work. The idea of this manner of sewing is to distribute the strain of the lacings as much as possible. To sew, begin at *B* with one lace and work over to *D* with the straight laps. Then begin at *A* and lace the cross laps, ending at *C*. An odd design of the dovetail method of lacing is exhibited in sample 7, which is adaptable for belts which have to run at an excessive rate of speed upon a narrow pulley of small diameter. A feature of this splice is the small length of lace leather required to make a strong union. Begin sewing at *A*, go to *B*, then

over and over to the end, finishing at *D* and *C* as shown. A half-cross pattern for common work is given in number 8, which can be formed with either a single or double lace by starting at *A* and lacing the one system of crosses to *D*, then taking up the other system at *B* and proceeding to *C*, there ending. It will be found that an effectively laced belt will aid materially in getting a larger and more regular product from both winding and knitting machinery.

BOSS KNITTER.

Designing in Hosiery Manufacture.

JAMES H. QUILTER.

Continued from December.

Designing on rotary frames as stated in my last article, has now become a most important branch of our trade. This is being done by what is known as the "Check Machine," an adaptation of the warp machine. By this arrangement the particular style of designing is by "plaiting," that is, using of several colored threads, each of which be so that only one color is seen on the face of the fabric, while the other will be kept in position behind it. The most elaborate designs in squares, ziggags, plaids, etc., on this principle are being made on latch needle frames and Cotton's patent frame, having vertically bearded needles.

As designing on latch needles forms an article in itself, I intend now giving in detail the particular system as adopted under a special patent, for the designing by plaiting on the Cotton frame, by using warp threads in conjunction with those usually used and known as the weft thread. We will suppose that the principles of the Cotton rotary frame are known to our readers, but to make it more clear, it must be noted that the needles have a vertical position on a moveable needle bar, such bar having an up-and-down motion and a tipping-backward-and-forward one. This needle is shown at A, Fig. 19. The weft thread is laid to these needles by a traveling carrier needle passing in front of the needles and under the beards, thus allowing the sinkers to form a loop on each needle. This carrier has a backward and forward motion from right to left, and vice versa.

In order to understand the principle of introducing several colors, it may here be explained that several weft threads may be used, each having its own carrier and carrier needles, each having its own movement. If there are, say, two or more carriers for the purpose, each carrier has a separate and

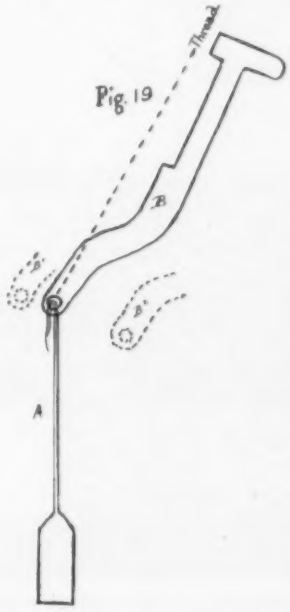


Fig. 19

distinct movement across the needles and back again, this being repeated any number of times. This carrier then remains stationary while a second carrier makes a circular movement. We will suppose for the purpose of making a plaid as shown in Fig. 20, two carriers are required; and as this particular plaid has three colors, black, red and green, the two weft carriers would have, one a black thread the other a red. In design Fig. 20, the

following colors are shown represented as follows:

Black by black squares.
Red by white squares.
Green by shaded squares.

The whole shows a part of a special plaid, the making of which will be explained. Taking first the weft threads, we have at

B^1, one black course. This is the last course of an horizontal stripe, a repetition of which is partly shown again at B^4.

A^1 shows 10 course red.
B^2 " 6 " black.
A^2 " 2 " red.
B^3 " 6 " black, as at B^1.
A^3 " 10 " red as at A^1.
B^4 " part of courses in black. This stripe usually is a broad one.

D^1, 24 needle stripe of black crossing black and red.

D^1, 12 needle stripe of green crossing black, but not red.

C^2, 14 needle stripe of black crossing black and red.

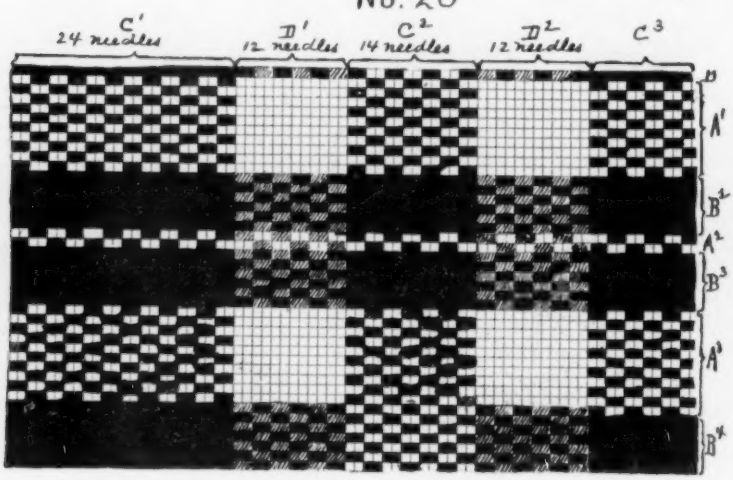
D^2, 12 needle stripe of green crossing black, but not red.

C^3, repetition of C^1, etc., continued.

Each warp thread lays a thread over two needles, so that at C^1, 12 guides are used; D^1, 6, C^1, 7, and D^2, 6.

One of these guides is shown at B, Fig. 19, as it has just laid the thread round the needle, which has lowered the loop, making a new loop under the needle beard. B^1 and B^2 show in dotted lines, other positions to which the guide can move to pass through the needles. A sideway motion of two

No. 20



Now it will be seen that the plaid in question has horizontal red and black stripes, being broken by other threads; these being warp threads supplied on a system peculiar to this machine. These form perpendicular stripes, that at C^1 being black thread, D^1, green thread, C^2, black thread, or it might be for change, blue thread. D^2, green, same as D^1, and C^3 as part of a broader stripe, being a repetition of C^1. Thus we have at

needles being given to them. They lay a loop in front of two needles and then move back while the course is made in the usual manner. The loops so laid appear in front of those laid by a weft thread.

It must be understood that by special arrangement any guide can lay its thread at one course and others at other courses. By referring again to Fig. 20, we shall see that at A^1, the first guides 2, 4, 6, 8, 10, 12, lay threads

over 3, 4, 7, 8, 11, 12, 15, 16, 19, 20, 23, 24. Then at next course, guides 1, 3, 5, 7, 9 and 11, lay their thread round needles 1, 2, 5, 6, 9, 10, 13, 14, 17, 18, 21, 22. Here the guides with green thread do not come into action, that is, at D^1. At courses B^2, guides at C^1, C^2 and C^3 go out of action, and guides at D^1 and D^2 come into action, 1, 3 and 5 guides at one course and guides 2, 4 and 6 at the next, thus continuing alternately till B^2, A^2 and B^3 are complete, though at A^2 they are alternate with red and not black loops.

It will be seen that A^1, part C^1 is 2 loops, alternate black and red. D^1 is all red, the guides here being out of action. Their threads simply lie as loose threads at the back of the fabric. A^1, part C^2, is as C^1 and D^2 as D^1. At B^2, B^3 and B^4, when black warp threads go out of action, the weft being black, the whole is black loops. B^4 being a complete square, B^2 and B^3 stripes cutting through, being each broad stripe, to form such square. This principle lends itself to a variety of plaids as both weft or ordinary threads can be changed as often as required and warp threads can be varied every two needles if desired, so the guides can be so controlled as to lay such thread at every other course or at stated intervals according to the design to be produced.

Before leaving this principle it must be explained that by such changing of the warp guides an equal amount of thread is not used from each warp. Therefore, this necessitates each warp thread being on a separate bobbin; it may be a small bobbin fixed on a bobbin back above the machine, or, as on the machine referred to, a set of bobbins may be placed side by side, the threads passing downward to needles. These bobbins represent those used for thread on an ordinary lever lace machine, which are very suitable for the purpose, as they are circular discs, the thread being wound inside two of such discs. The bobbin revolving in a carriage fixed to support it, such being removable from machine in order to take out empty and put in full bobbins or for changing colors. When required, such carriages are held in position by suitable means. This principle of producing checks is unique and differs from the principles of the check machine as adopted to horizontal needle frames, which will be described in our next article.

To be continued.

Changes in Knitting Machinery Requirements

The Knitters' Circular, England, says that from all quarters the revolution in the style of manufacture of hose and half-hose is noted. The introduction of seamless machinery has entirely altered the character of trade, and also reduced the value of plants of rotaries and Cotton's patents. Though better class goods will still be made on such machines, the bulk of trade is turning in the direction of seamless. The effect of this alteration has been most marked upon the plain circular hose and half hose branch, which is just now comparatively *nil*. Manufacturers complain of the sudden depreciation of that class of machinery which has done so much toward raising the character of the trade, until it has become a serious matter with holders of circular, rotary and Cotton's system of machinery. This great revolution is apparently, at present, confined to the larger hosiery districts, for from outside districts, reports do not speak of this great change, but more of the falling off in cotton goods, which are being replaced by cashmeres. Several reports note an improvement in trade in better class goods. Especially is this noted where the improved seams have been introduced, more particularly in reference to the heavy woolen underwear, where the character of seams was such as needed an alteration. This is no doubt due to the introduction of overlock machines, these being also largely used in the cardigan trade. Knitted woolen gloves

are more in demand, and various new ideas are noted in pointing same, viz., by glove embroidery machines, by introduction of warp threads, etc.

—Fancy golfing stockings and sweaters are in relatively fair request. Combination garments in cotton, wool and in union goods are selling moderately.

—People are only too thankful if anything will give a safe 5 per cent. for the capital invested, and that return is annually becoming more difficult.

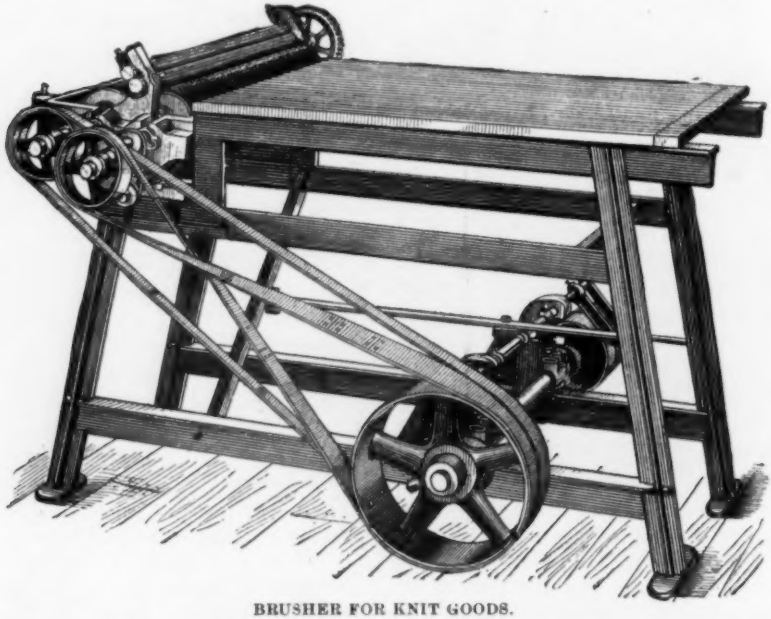
Knit Goods Brusher—1897 Model.

We here illustrate an improved brusher for knit goods put on the market by Lewis Jones, Phila., Pa. Its important features are its solidity and the fine nap that it will produce.

With rolls arranged one above the other, it is claimed that the weight of the fabric frequently causes a heavier nap on the under side of the goods, while with the horizontal arrangement this is said to be not the case.

The framework is cast in one solid box-like casting, which makes it perfectly rigid and interchangeable; phosphor-bronze boxes are fastened to this frame, thus providing for cheap and quick renewals in case of excessive wear. The gears are all cut gears, and most of them are steel.

The machine is mounted on a solid iron table, and so arranged that, by the renewal of a few inexpensive parts, the machine will never wear out.



BRUSHER FOR KNIT GOODS.

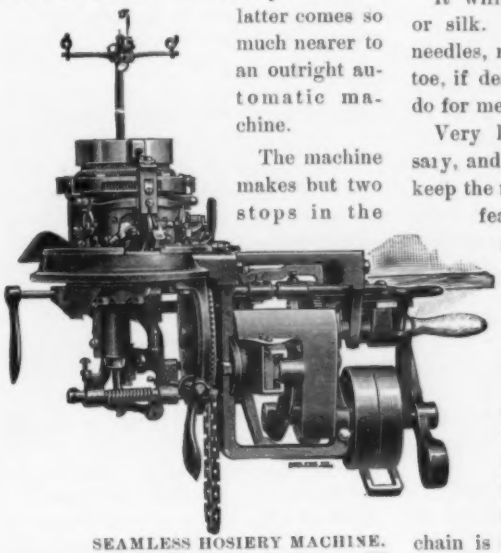
—There is abundant evidence to prove that the productions of India found their way, at a very remote period, into Egypt, Palestine, Phœnicia and the countries bordering on the Mediteranean. Still, Babylon, Egypt, Greece, Italy, Portugal and Gaul, each in its own way, produced results which are as difficult to realize at the present day as it is to account for the number and variety of specimens of these perishable articles that still exist in an almost unchanged state, when so many of their great, and apparently permanent, achievements have perished.

—The market for cotton hosiery and underwear for spring has been quiet at first hands during the week, reorders from the jobbing trade proving moderate in the aggregate.

—Hosiery jobbers report a good demand for fast black hose in the heavier makes for immediate consumption.

Seamless Hosiery Machine.

We illustrate herewith an improvement made by the well-known Boss Knitting Machine Works, Reading, Pa. It is called a 15-16 automatic seamless hosiery machine, intended to take the place of a full automatic. The important feature about this machine is that it contains only a small number of gears and chains that are liable to frequently got out of order. Its simplicity commends it to manufacturers, an idea of which can be had by reference to the illustration. This invention has been attained by certain ingenious changes in the 3-4 automatic knitter, by which the latter comes so much nearer to an outright automatic machine.



SEAMLESS HOSIERY MACHINE.

The machine makes but two stops in the process of manufacturing a stocking. It breaks out the extra splicing-yarn in the heel and toe, and changes from the reciprocating to the circular motion, all by automatic action.

In making half hose, one operator can run three or four machines, and in making ladies' and misses' stockings, from eight to twelve. Under these conditions each machine, it is said, will turn out from six to ten dozen every day.

The cylinder can be transferred as readily as upon the old style machines for knitting half hose or rib hose.

The machine is built with great regard for compactness and strength, and will stand all factory strain without injury. It has but few parts, all interchangeable. Any cylinder from 84 to 200 needles can be used in one machine, and can be changed in a few moments.

The cylinders are made of the very best steel forgings that can be found in the market. The machine runs at a high speed, and an unskilled operator can, with ease, learn to operate it from the experience of a single day.

It will knit perfectly, cotton, wool or silk. It runs easily, breaks few needles, makes a large heel and small toe, if desired, and leaves no work to do for menders.

Very little repairs are ever necessary, and machinists are not required to keep the machine in order. One of the features is a web-holder of remarkable simplicity.

The method of fashioning ladies', misses' and children's hose and men's half hose, is wholly automatic.

The machine runs with a single belt. The tension is always automatic in the heel or toe to any size of splicing yarn. Dropping of stitches is completely avoided. But one chain is employed for widening, running, measuring and stopping. No weights are used.

The machine is built in sizes from 2 1-4 up to 4 1-2 inches, 1-4 inch to each size.

Any further information can be obtained by writing to the Boss Knitting Machine Works, 7th and Walnut Sts., Reading, Pa.

—Jute is rather more lustrous than cotton, because its fibres are more smooth and parallel in formation, and reflect more light.

POWER DEPARTMENT.

O. R. YOUNG, M. E., Editor.

Stopping Leaks.

BY REX.

There is probably no better, surer or quicker way known to bring a steam plant to perfection, or so near it as a plant ever comes, than by stopping the leaks.

What do you mean by leaks?

Well, their name is legion, and each one contributes materially towards reducing the efficiency of a plant. We will name a few as they occur to us and others may be supplied by any engineer who runs across them in his daily work.

"Mike," said I one morning to our head night fireman, "I notice considerable fresh coal in the ash pile; how is it?"

"It comes from number four, sir," replied Mike.

"Why should it? Don't you see that is throwing away coal?"

"I know it; but, you see, the grates don't fit in any of the furnaces and it runs down behind."

"But why didn't you say so and have them fixed?"

"Well, the other chief used to say that; if they were left loose then we could take the bars out easier."

"And so you have been carting out tons of good coal every month in order that one of these days say some five or six years hence those grate bars may be taken out easily?"

"That's about it, sir."

"Well, we will change that a trifle." And when the next "engineer's repair day" came, as they generally do once a week, we overhauled those ten furnaces and saw that the space back of the grate bars was filled in.

Cost something?

Oh, yes, a trifle; but what is a few hours' time once in five years in comparison to paying $4.50 a ton for coal to cart out in ashes?

This is a point that is too often neglected by firemen. Look over your steam plants and see in how many furnaces the grates have either a wide space at the back or side.

Now, I don't mean that one should allow the furnace to clinker up all around till it narrows down the grate surface as many do, but to have your grates set so that the space around them will not let any appreciable amount of coal through. As for clinkers in the wall, they are often the cause of those spaces, for a shiftless fireman will allow his furnace walls to clinker up, and then in trying to break the clinkers off later will take away part of the fire brick and leave those "leaks."

Another source of leakage is in pipe joints and around valve stems. Every pound of steam which is allowed to escape around your plant means just so many dollars thrown away, and if your engineer is what he should be he will not allow it. Now don't jump at the conclusion that there will never be any leaks, as a manufacturer does, for they will crop out, and the fact that we are increasing our pressures every day makes them more numerous; so Mr. Manufacturer, when you happen to hear steam hissing from a joint or valve, don't talk to your engineer as though he was stealing gold out of your pocket, but mention the fact to him as though it was something he had not discovered instead of being guilty of. Then give him proper time to fix it.

I have met men before now who, it would seem, to judge from their actions, thought it both possible and policy to disconnect a steam pipe and

make a joint with from 90 to 200 pounds pressure on it.

I hear some remark, "How absurd." Just so, but didn't you ever know of a man coming around in the morning and notifying you of a certain steam leak and then repeat the information in the afternoon, when both he and you knew that it was absolutely necessary to keep steam on that pipe certainly till night and often till Saturday night before it could be shut off for any repairs?

Just here is where that much-abused fitting, "the clamp," comes in play. "Much abused," because it is a very handy article to stop a leak until such a time as it can be repaired without detriment to the work, and at the same time after it is once put on and the leak closed the piper is more than apt to let it remain instead of fixing the pipe as he should do at his earliest convenience.

One can easily see how this would affect a system of piping if allowed to go on indefinitely. You would soon have pipes looking like a junk shop and after a while that pipe which has been giving out little by little would go with a rush and make considerable trouble. Therefore, keep clamps on hand for steam leaks, but use them only so long as the emergency requires.

There is a saying much used by some so-called engineers in regard to a piston rod stuffing box; that is, "where it is leaking a little you may know it is running free." So it is, too free to suit me, and you may be sure that if it is running free now, it will soon run too free and you can't stop it either, for the rod is apt to be grooved after a while, and when it is there is bound to be trouble in camp.

Then, again, when steam blows by a rod, it sometimes means something else than need of packing, for it seldom blows out all around at the same time. It may mean that your engine is out of line, or that the piston needs centreing, either of which will become worse daily if allowed to continue.

"I can't keep that engine tight, anyway," said an engineer to me once.

"Why not?"

"I don't know; I pack it every other night, and still it will leak after running an hour."

Investigation showed that the springs in the piston had allowed it to dropped just enough to wear the stuffing box and let the steam blow through over the rod. A few hours' work in the cylinder not only saved him the time used every other night in packing the rod, but also the cost of the packing used.

It is always poor policy to be sure that a rod is running free by allowing the steam to leak around it, and a good engineer not only has no need to, but he will not allow it.

"Mr. Rex, what's the matter with that steam trap?" said the superintendent to me one day.

"It leaks; in fact, it is worn out in the first place, and never was good for much in the second, and if you will remember, I placed an order with you for one to replace it some months ago, when you told me you would buy no more traps this season anyway."

"But I won't have it leaking like that."

"Well, we can plug the pipe or put on a new trap, just which you prefer."

"You see Pat, and find out if there isn't another trap in the shop that can be used."

I sent for Pat and told him the Superintendent's wants. He didn't faint, but looked as though he wanted to.

"See here, Mr. Rex," said he. "I don't know how Mr. X expects taking off a worn out trap and letting it lay in the junk heap a year benefits it. He knows very well that every trap taken off for the last ten years has been because it was worn out, and still he advises you to change one worthless one for another. We can do it, but what good will it do?" That's just the point. Haven't you ever heard of just that kind of work being done in your own experience?

How many times will a manufacturer report a valve leaking somewhere, and want you to try another

old one on, to see if it won't be tight?

Seems absurd, doesn't it? but just think how many times you have known it to be done. You can't stop leaks with snow or old worn out fittings, and "Mr. Manufacturer" don't try, or expect your engineer to.

I have heard engineers remark that they allow their boiler blow-offs to leak a little, just to keep them free.

When I first had charge of a boiler I tried that, having heard an old gray headed engineer say that it was the proper thing. I am not continuing the habit, for our boiler was scaling badly and the blow-off drifted full and then gradually filled up with sediment around it, till that pipe was about as solid in the centre as on the shell, and we had to cool the boiler off, draw the water out through the feed pipe—which went in at the front end, another bad arrangement, and put in a new blow-off.

Then again, I hardly advocate the practice of heating water in a boiler just to let it run out again—and one has very little idea of how much water will run through a leaky valve in the course of a month.

Then comes the leaking safety valve which allows to escape a certain portion of the very cream of the steam, for the most valuable by far of all the steam in a boiler is that at the top, and it all means pounds of coal.

If the engineer could only see written on every steam leak, "coal wasting," I think they would be rather more cautious about letting them run, and it certainly means nothing else. I am willing to admit, though, that the manufacturer is not infrequently as much to blame as the engineer. The latter may be a good man, but it takes more than an ordinarily good man to make something without either stock or tools to do it with. Let the manufacturer do his part in furnishing those to work with, and then hold his engineer responsible for keeping leaks stopped.

There are many other kinds of leaks, such as leaking oil cans, leaking pumps, etc., but the same rule applies to all. Wherever you see a leak, it means money thrown away.

Moral: Stop the leaks.

Horse Power Transmitted by a Single Belt.

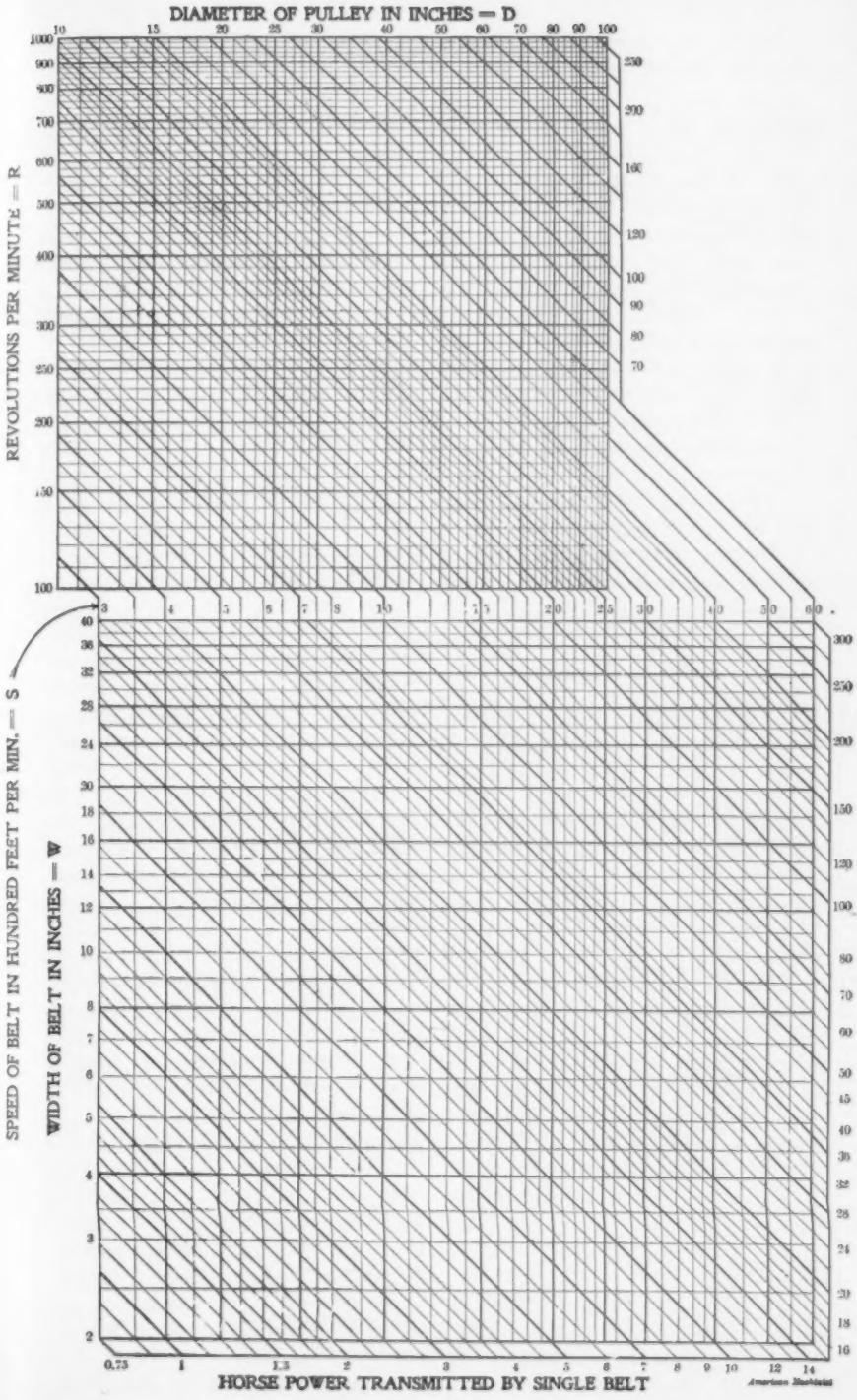
S. T. Freeland, in writing to the American Machinist, gives the following very handy diagram for ascertaining the speed of or the horse power transmitted by a single belt. In other words, the table is so arranged that having the other factors known, any one unknown factor may be readily determined.

The diagram, which looks somewhat complicated at first, with a few minutes study will prove to be very simple, and one of the most accurate and rapid methods of finding out the desired quantity.

It will be noted that the distance between the figures are divided into spaces, each representing a certain division between the two numbers, in some cases meaning ½, in others 1, and in others 100. A few moments practice will easily familiarize the reader with the same.

Suppose, for instance, we have a 40-inch pulley to run 200 revolutions per minute, and wish to take from this pulley 10 horse power. What we wish to know is—how wide must the belt be?

At the extreme top of the diagram is a row of figures standing for pulley diameters, and taking 40 (the diameter of our pulley in this case) we follow the vertical line designated 40, down to its intersection with the horizontal line which is designated at the left 200 (which number represents our number of revolutions per minute), and from this point of intersection we follow the line diagonally downward and to the right until we come to the line of figures representing belt speed in hundreds of feet per minute, and we find it is nearly 2100 feet. This last figure is not needed in this instance, but the diagram shows what it is, and it costs us nothing to note the speed. From this point we follow vertically downwards until we intersect the diagonal line representing 10 horse power (numbered at the bottom of the diagram), and the figure at the left of this point of intersection shows that the belt must be 4 inches wide.


DIAMETER OF PULLEY IN INCHES — D
REVOLUTIONS PER MINUTE — R
SPEED OF BELT IN HUNDRED FEET PER MIN. — S
WIDTH OF BELT IN INCHES — W
HORSE POWER TRANSMITTED BY SINGLE BELT
American Machinist

Heat and its Application to Steam Generation.

A lecture delivered before the members of Mass. No. 1, N. A. S. E., by P. H. Hogan, StatePres., N. A. S. E.

We will now consider a few other sources of loss of heat in the engine room and boiler room.

The direct acting steam pump is, as you all know, very wasteful in the use of steam. The ordinary direct acting boiler feed steam pump requires from 80 to 125 pounds of steam per horse power per hour. Now, if the suction valves in your pump should leak, you will be forcing water back into the tank, and if the discharge valves and the check valves or feed pipe leak, water will be forced back into the pump cylinder, and in either case you would be doing useless work by the aid of a very wasteful medium.

The pump valves and the check valves or feed pipe should be examined occasionally, as about the only way in which you can detect a leak from the outside is in the perceptible increase in pump speed required to maintain the proper water level in the boiler.

Another source of loss of heat comes from leaky blow-off cocks. This loss will depend on the temperature at which the water is pumped into the boiler and the pressure at which it is evaporated.

If the feed water enters the boiler at 40° and is evaporated at 100 pounds pressure, we will have added to each pound of water 298 heat units which means a loss of one pound of coal for every 33 pounds of water passing through the blow-off cock.

If the feed water was heated at 210° by exhaust steam, this loss would be reduced to one pound of coal for 85 pounds of water discharged through the cock.

Some years ago I adopted a method for keeping blow-offs tight, which seems to work very well, and since using it I have had no trouble with leaks at that point. Just outside of the boiler setting I put on a gate valve and outside of that the ordinary plug cock. Although I do not depend on the valve for tightness it will always be tight enough to allow me to take out the cock to repair or replace it while the boiler is running (I do not recommend the use of a valve alone on blow-off pipes because they are almost sure to leak after having been opened a few times).

Another advantage I claim for this arrangement is that when you wish to blow-off under pressure, you can open the cock wide and regulate the flow through the valve by opening slowly, and again in closing. Close the valve first and then the cock. This will not only prolong the life of the cock, but is in my opinion much safer, for the reason that if it is your practice to blow off under high pressure a sudden opening of the cock brings quite a strain on the blow-off pipe and in the hands of a careless man might at some time result in a broken fitting.

Another source of loss of heat is found when steam pipes are improperly covered, and we find many cases where they are not covered at all. Tests recently made at the Institute of Technology, show that the loss of heat from a 6-inch steam pipe at 100 pounds pressure in a still room at 72° F. (the pipe not covered), was 14.5 B. T. U. per minute for each foot length of pipe.

Now let us see what that will amount to in pounds of coal. Suppose we have 100 feet of 6-inch pipe at 100 pounds steam pressure, the loss in B. T. U. per hour would be $14.5 \times 100 \times 60 = 87{,}000$, then if we are utilizing 75 per cent of the heat in the coal or 10,000 B. T. U. per pound, the loss would be represented by $\frac{87000}{10000} = 8.7$ pounds of coal per hour. If we run ten hours per day—300 days per year, and pay $4.00 per ton for coal, the loss per year would be $\frac{8.7 \times 10 \times 300}{2000} \times 4 =$ $52.20 per year.

The best coverings in the market will reduce this amount 75 per cent., and in

this particular case would make a saving of $39.15 per year.

Another source of loss of heat comes from not utilizing the exhaust from the engine for heating feed water. The following are a few figures taken from a boiler maker's catalogue, showing the amount of saving due to heating feed water by exhaust steam, or rather by utilizing heat that would otherwise be thrown away:

There are two sources of waste heat available for heating feed water. Exhaust steam and chimney gases. With a properly proportioned heater you can heat the feed water up to 200 or 210° F. with exhaust steam, then by forcing it through what is called an economizer (which is nothing more than a heater placed between the boiler and the chimney, for the purpose of utilizing a portion of the heat in the escaping gases), it can be heated up to a very high temperature, sometimes as high as 320° F., making a saving in some instances of 20 per cent.

The more wasteful the boiler the greater the benefit of the economizer. As the draught in the chimney depends on the difference in temperature between the inside and outside of chimney, any reduction in temperature on the inside must necessarily reduce the draught, and I have no doubt that economizers are oftentimes condemned on account of not having been properly proportioned to the amount of work required of them.

There are, however, several large plants in this country equipped with economizers which are also provided with artificial draught. In such cases there is no apparent reason why the temperature of the escaping gases should not be reduced to nearly that of the feed water entering the economizer. Personally I am a firm believer in the use of economizers. I have consulted several engineers who have used them, with regard to the saving made by their use, and find that they are unpopular among the engineering fraternity, but when I ask them why they are opposed to them, they seem inclined to evade the question.

There are several other sources of loss of heat, in the engine room and in the boiler room, such as leaky valves, leaky steam traps, engine valves and pistons that leak, leaky boiler settings, boilers that are not kept clean both inside and out, tops of boilers not properly covered and so on.

If your boiler room is hot, heat is being lost. If your engine room is hot, heat is being lost. All these things count, and the engineer who takes an interest in the plant he is running and does all he can to prevent these several losses, not only becomes more valuable to his employer, but the knowledge gained by the experience is bound to advance him in his calling.

Problems for Engineers.

JOSEPH H. McNEILL.

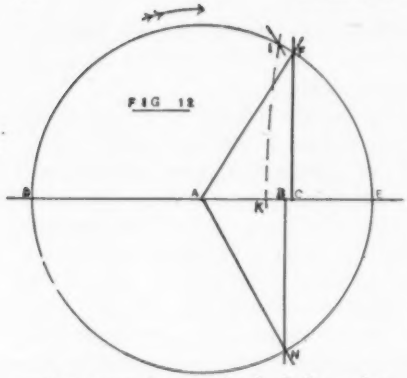
To find the relative piston, and valve positions, on a plain slide valve engine by removing the steam chest cover, turning the engine over by hand and watching the movements, is not always an easy task, especially with an engine of any size and with the driving belts on the pulleys.

If the plant is running constantly, the engineer will not have an opportunity to do much work of this description; but if the necessary data has once been found, much knowledge can be gained from diagrams.

If we wish to find the position in which the piston will be, when cut-off occurs, the lap, lead and travel of the valve, the stroke of the engine, and the length of the connecting rod being known, construct the following diagrams:

Draw a circle, Fig. 12, whose diameter equals the full travel of the valve; that is, the radius will equal the throw of the eccentric.

From the centre of circle *A* lay off *A B* equal to the steam lap of the valve,



and *B C* equal to the lead of the valve. Draw *B H* and *C F* at right angles to *D E* with *D* as a centre and with a radius equal to the distance between the points *F* and *H* where the line *C F* and *B H* cut the circumference of the circle, draw an arc cutting the circumference in the point *I*

The point *F* gives the position of the throw line of the eccentric when the crank is on the dead centre *D*

The point *H* gives the position of the throw line of the eccentric when the crank has reached the point *I*, which point is the point of cut-off.

The diameter *D E* of the circle equals the travel of the valve. It also equals the stroke of the engine to a certain scale; that is, if the line *D E* is three inches, and the stroke of the engine 12 inches then the line *D E* equals one-quarter of the stroke, or one-quarter scale.

To find the position of the piston in the cylinder when the crank pin is at the point *I*, extend the line *D E* in the direction *E* and with a pair of dividers, set at the length of the connecting rod (to the same scale as the line *D E* is to the stroke) one end resting on the line *D E* extended, the other end at *I*, draw the arc *I K*.

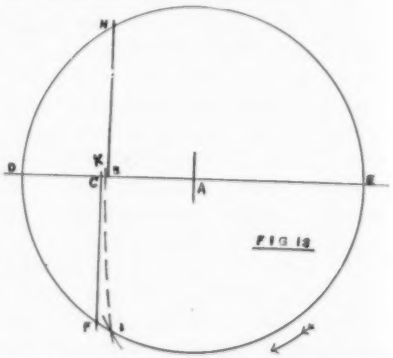
The distance *D K* is to the piston position as the line *D E* is to the stroke.

If the line *D E* equals one-fourth of the stroke then multiplying the distance *D K* by four will give the distance the piston has moved from the head end *D* of the cylinder, when the crank pin has reached the point *I*, the throw line of the eccentric the point *H* and the valve has closed for steam, the crank pin and eccentric rotating as shown by the arrow.

Let us now apply the same diagram to find the point of cut-off from the crank end (*E*) of the cylinder.

From the centre *A* Fig. 13 make *A B* equal to the lap of the valve and *B C* equal to the lead.

Draw *B H* and *C F* at right angles to *D E* with *E* as a centre and with a radius equal to the distance from *F* to *H* draw an arc cutting the circumference of the circle in the point *I*.



With a radius equal to the length of the connecting rod (to the same scale as the distance *D E* is to the stroke) and from a centre on the line *D E* extended beyond *E* draw the arc *I K*. *K* is the piston position (to scale) from the end *E* of the stroke when the crank is at the point of cut-off *I*.

Now compare the distance *D K*, Fig. 12, with the distance *E K*, Fig. 13, to find the variation in the points of cut-off from each end of the cylinder.

From these diagrams it can also be seen, that a more equal cut-off is gained with a longer connecting rod; and that the points of cut-off become more unequal as the steam lap is increased.

If it is proposed to alter the dimensions of the valve to shorten or lengthen the point of cut-off, the diagram can be drawn to show the necessary change required on the valve.

COLORS AND DYEING.

Dye Recipes for February.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 17.

Green on Cotton.

Direct Green on 100 lbs. cotton yarn:

Prepare dye bath with

1 lb. Direct Green Y.
(A. Klipstein & Co., 122 Pearl St., New York.)

Enter in yarn at boil. Turn at that heat for 15 minutes, then add 20 lbs. Glauber's salt, and turn one hour at that heat.

New Direct Green Y will dye union goods as well as cotton alone. It dyes both fibres evenly, producing level shades. The color is fast to light, alkalies and acids, and will not alter in shade when pressed. This color will combine with other direct colors. It is very soluble, and well adapted for combining with other shades.

RECIPE NO. 18.

Light Red on Wool.

Light Red on 100 lbs. wool yarn:

Prepare dye bath with

1½ lbs. Guinea Red 4 R.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
3 lbs. Oil of Vitriol.
10 lbs. Glauber's Salt.

Enter in yarn at 130° F.; bring to boil while turning, and turn to shade at that heat.

Guinea Red 4 R is a new color, and dyes a perfectly fast and brilliant shade of fast red, dyeing very level when entered in the dye bath at a high temperature.

RECIPE NO. 19.

Yellow on Worsted.

Yellow on 100 lbs. worsted yarn:

Mordant for 1 1-2 hours at boil with

2 lbs. Bichromate of Potash.
1½ lbs Tartar.

Wash and dye in a separate bath with

½ ounce Alizarine Red W powder, patented.
4 ounces Alizarine Yellow powder.
2 ounces Alizarine Green powder.
(C. Bischoff & Co., 87 Park Place, New York.)
1 lb. Acetic Acid.

Enter in yarn at 130° F.; bring to boil while turning, and turn to shade at that heat.

The above three colors combined will produce most any required shade needed, by varying the proportions of the colors. The colors being in powdered form will be very handy for the dyer, especially on light shades, as he will be sure to get uniform shades on each batch of yarn.

RECIPE NO. 20.

Blue on Cotton.

Vidaline Blue B on 100 lbs. cotton yarn:

Prepare dye bath with

3 lbs. Vidaline Blue B.
(Sykes & Street, New York.)
25 lbs. Common Salt.

Enter in yarn at boil, and turn one hour at that heat; shut off steam, and turn one-half hour longer without steam being turned on.

The above shade will be found to be very fast, and well adapted for dyeing cotton, and cotton and wool mixed goods, and like all Vidaline Blues, the color can be made extra fast by passing them through a blue vitriol bath after dyeing.

RECIPE NO. 21.

Light Blue on Cotton.

Light Blue on 100 lbs. cotton yarn:

Prepare dye bath with

20 lbs. Glauber's Salt.
½ lb. Calcined Soda.
½ lb. Diamine Azo Blue 2 R.
(Wm. J. Matheson & Co., 178 Front St., New York.)

Enter in yarn at boil, and turn one hour at that heat.

Diamine Azo Blue 2 R produces a full shade of blue on the reddish cast. It is fast to light and soap, and can be developed with any of the developers which the above firm recommends, such as Napthol Napthylamine, either N, or Fast Blue Developer A D.

RECIPE NO. 22.

Red Shade of Brown on Cotton Cloth.

Reddish Brown for 100 lbs. Cotton Cloth:

Dye bath is made up as follows:

2 lbs. Direct Brown V X.
(C. Bischoff & Co., 89 Park Place New York.)
2 lbs. Soda Ash (sodium carbonate) .71.
20 lbs. Common Salt (sodium chloride).

Enter the cloth (previously wet out) at 160° F., raise the temperature of the dye bath to the boiling point and continue boiling for one hour. Wash and dry.

This dyestuff comes in the form of a dark brown powder, and dissolves readily in hot water, giving a red-brown solution. It is necessary to use some care in the dyeing to prevent unevenness, the dyestuff, however, will go on to the fibre evenly. The shade produced is a red shade of brown, and can be made light or dark according to the amount of dyestuff used in the bath; the one here shown is about medium. The dye bath is not exhausted, and should be kept for future use, subsequent lots requiring less dyestuff to produce the same shade. The amount of water used in dyeing this sample was about 25 times the weight of the cloth.

RECIPE NO. 23.

Black on All Wool Cloth.

For 100 lbs. scoured woolen pieces.

Dye bath is made up as follows:

Have the bath half full of boiling water, then add

30 lbs. Glauber's salt (crystallized sodium sulphate).
5 lbs. Acetic Acid.

Fill up the bath with cold water, and add

6 lbs. Diamond Black G A (previously dissolved in boiling water).
(Farbenfabriken of Elberfeld Co., 77 William St., New York.)

Finally add

5 lbs. Acetic Acid.

Enter the cloth (previously wet out) at about 150° F., raise the temperature of the dye bath slowly to the boiling point and continue boiling for one hour. Lift the cloth and add to the bath 1 1-2 lbs. of chrome (potassium bichromate); re-enter the cloth, and continue boiling for 30 minutes. Wash and dry.

This dyestuff comes in the form of a black powder with a red cast containing coppery specks. It dissolves in boiling water, giving a dull purple solution. To effect complete solution the dye stuff should be well boiled with water; the color will then go on to the cloth evenly. The dye bath is almost exhausted, in fact, it should be exhausted, as any remaining color will be rendered unfit for use again from the fact of the chrome being added to the bath. If it is desired to use concentrated baths and keep the kettle standing, the chroming should take place in a separate bath. In using the one-bath method the dye bath should exhaust before the chrome is added; if it is not exhausted, a further addition of acetic acid will help the bath to exhaust. The amount of water used in dyeing this sample was about 100 times the weight of the cloth.

RECIPE NO. 24.

Dark Blue on Cotton.

Dark Blue on 100 lbs. cotton yarn:

Prepare dye bath with

3 lbs. Diamine Azo Blue 2 R.
(Wm. J. Matheson & Co., 178 Front St., New York.)
30 lbs. Calcined Glauber's Salt.
½ lb. Calcined Soda.

Enter in yarn at boil, and turn one hour at that heat.

Diamine Azo Blue 2 R is well adapted

for combining with the Diaminogene Blue. It is fast to light and washing, and can be developed also. The color works perfectly level, and penetrates quickly, leaving the yarn soft and pliable, and does not crock.

RECIPE NO. 25.

Blue on Cotton.

Fast Blue on 100 lbs. cotton knit goods:

Prepare dye bath with

12 ounces Vidaline Blue 5 B.
(Sykes & Street, New York).
2 lbs. Fankhausine.
(Nashoba Co., Ayer, Mass.)
10 lbs. Glauber's Salt.

Enter in cloth in dry state at 160° F. Bring up to boil while turning, and turn to shade at that heat.

The above shade is well adapted for hosiery, on account of the soft and silken finish which Fankhausine gives it. Fankhausine, when used along with the direct dyes, is one of the best assistants that can be used. It brightens the color, and makes it faster to light and washing, besides which, the cloth, yarn or raw stock can be dyed without boiling them out first.

RECIPE NO. 26.

Red on Wool.

Red on 100 lbs. wool yarn:

Prepare dye bath with

3 lbs. Guinea Red 4 R.
(New York & Boston Dyewood Co., 55 Beekman St., New York.
10 lbs. Glauber's Salt.
4 lbs. Oil of Vitriol.

Enter in yarn at 130° F. Bring to boil while turning, and turn to shade at that heat.

A brilliant shade of red is here shown, dyed with Guinea Red 4 R, which is a new color lately introduced. It will combine with all acid colors, being fast to light and fulling.

RECIPE NO. 27.

Blue on Cotton.

Vidaline Blue on 100 lbs. cotton yarn:

Prepare dye bath with

3 lbs. Vidaline Blue R R.
(Sykes & Street, New York.)
25 lbs. Common Salt.

Enter in yarn at boil; turn at that heat for one hour; shut off steam and turn one-half hour longer, till finished.

Vidaline Blue R R is of a reddish cast of blue. The importer has an extreme greenish blue called 5 B, with which any shade of blue can be dyed by combining the two blues.

RECIPE NO. 28.

Golden Yellow on Cotton.

Golden Yellow on 100 lbs. cotton yarn:

Prepare dye bath with

12 lbs. Extract Fustic 51°.
(Stamford Manufacturing Co., 133 Front St., New York.)
2 lbs. Blue Vitriol.
2 lbs. Soda.

Enter in yarn at 140° F.; bring temperature up to 180° while turning, and turn one hour at that heat; lift out and enter a second bath to which one pound of bichromate of potash has been added. Then give six turns at 110° F. Extract without washing.

Extract Fustic is also well adapted for wool dyeing, on account of its being a pure extract, being entirely free from adulteration. It is a very concentrated color, and is very well adapted to use in combination with other extracts and alizarines, on account of its not changing its shade with continuous boiling. It will show up a clear and pure shade when dyed on a chrome and tartar preparation, and it can be used to an advantage on account of its cheapness. Silk dyers and printers will find it to their advantage to use it.

RECIPE NO. 29.

Navy Blue on All Wool Cloth.

For 100 lbs. of scoured woolen pieces:

Dye bath is made up as follows:

2½ lbs. Sulphon Cyanine G R extra.
(Farbenfabriken of Elberfeld Co., 77 William St., New York.)
5 lbs. Acetate of Ammonia.
10 lbs. Glauber's Salt (crystallized sodium sulphate.)
¼ lb. Chrome (potassium bichromate.)

Enter the cloth (previously wet out)

at 100° F., raise the temperature of the dye bath to 170° F. slowly, then add to the dye bath 2 lbs. of acetic acid. Raise the temperature of the dye bath to the boiling point, and continue boiling for one hour. Wash and dry.

This dyestuff comes in the form of a dull black-blue powder, and dissolves readily in boiling water, giving a red-blue solution. The dye bath is entirely exhausted, and the shade produced is a navy blue with a red cast. This color can also be dyed by keeping the temperature of the dye bath below the boiling point, in which case it is unnecessary to add the 1-2 lb. of chrome. The dyestuff possesses great tinctorial power, and requires that some care be used in the dyeing to prevent unevenness or streaking. There is another dyestuff similar to this, and it is marked Sulphon Cyanine 5 R extra; this dyes in the same way, having the same properties, and produces a redder shade. The amount of water used in dyeing this sample was about 100 times the weight of the cloth.

RECIPE NO. 30.

Drab on Cotton Yarn.

Fast Drab on 100 pounds Cotton Yarn.

Prepare dye bath with

6 ozs. Fast Diphenyl Black, Patd.
(John J. Keller & Co., 101 Murray St., New York.)
15 lbs. Glauber's Salt.
2¼ lbs. Sal Soda.

Enter in yarn at boil and turn one hour at that heat.

For dyeing light shades such as pearl grays, drabs or slates, Fast Diphenyl Black, Patented, is very well adapted, as such shades can be dyed in one bath at a low cost. The shades are very fast and dyers of hosiery will find it a very good color to use, both for light shades and black. The Diphenyl Black will also dye union goods an equally fast and even shade.

RECIPE NO. 31.

Fast Black on Cotton Yarn.

Prepare dye bath with

6 lbs. Fast Diphenyl Black, pat.
(John J. Keller & Co., 104 Murray St., New York.)
25 lbs. Glauber's Salt.
5 lbs. Sal Soda.

Enter in yarn at boil; turn at that heat one hour; shut off steam and turn slowly one-half hour longer.

The above shade of black is dyed with only 6 lbs. of color. The color is extra fast to light and washing, and will not bleed into white. It will stand acid, and is very well adapted for cross dyeing, and will penetrate the thickest fibre.

RECIPE NO. 32.

Medium Blue on All Wool Cloth.

For 100 lbs. of scoured woolen pieces:

Mordant as follows:

3 lbs. Chrome (potassium bichromate).
1½ lbs. Tartar (potassium bitartrate).

Enter the cloth (previously wet out) at 160° F. Raise the temperature of the bath to the boiling point in 30 minutes, and continue boiling for one hour. Wash and dye as follows:

10 lbs. Phenocyanine V S (paste).
(A. Klipstein & Co., 122 Pearl St., New York.)

Enter the cloth cold, run cold for 20 minutes, then raise the temperature of the dye bath to the boiling point in one hour, and continue boiling for one hour. Wash and dry.

This dyestuff comes in the form of an intense green paste, and mixes well with cold water, giving a green solution. The color goes on to the fibre evenly, and the shade produced is a very good and bright blue. The shade here shown is not a full shade, and can be made much darker and fuller by increasing the amount of dyestuff. The dye bath is completely exhausted. Besides being dyed as given here, Phenocyanine can be dyed by the one-bath method, and then fastened in the same bath by the addition of chrome. In using the one-bath method it is necessary to add either acetic acid or sulphuric acid to the bath. The amount of water used in dyeing this sample was about 100 times the weight of the cloth.

BLEACHERS!

Write for pamphlet, just issued, on

BLEACHING

With Peroxide of Sodium.

THE ROESSLER & HASSLACHER CHEMICAL CO.

73 Pine St., - New York.

Our February Color Recipes.

We present this month an unusual line of handsome samples of fashionable colorings, which manufacturers and dyers will be much interested in.

In recipe 17 will be seen a new shade of green on cotton, obtained by the use of Direct Green Y, furnished by A. Klipstein & Co., New York. This dye is used for cotton, wool, union goods and half silk. It stands light and washing like other direct colors, and stands acids and alkalies very well, and does not turn into violet by the influence of soda. It turns bluer when heated, but the original shade comes back as soon as the stock is cooled again. It is very soluble, and gives very even shades. This house also appears in recipe No. 32, showing a medium blue on all-wool cloth, obtained by the use of Phenocyanine V S. This latter shows a bright blue on wool. The shade is quite fast, and is good as a self color or in combination for the production of compound shades. In a scouring solution the shade suffers but little change. White yarn plaited with it and scoured in the same solution is not stained, showing great fastness to scouring and fulling.

A particularly bright and most interesting color will be noticed in recipes 18 and 26, obtained through the use of Guinea Red 4 R, furnished by the New York & Boston Dyewood Co., New York. This is a new color, and one to which we desire to call the particular attention of dyers. We find it dissolves easily, and when dyed in an acid bath yields brilliant, bluish-red shades on wool and silk, as well as on all other animal fibres. It is advisable to dye in wooden vats, because the use of copper vessels renders the shade not only considerably bluer, but also duller. It dyes perfectly level even in the lightest tones, and is as well adapted for shading purposes in the production of delicate fancy shades as for dark dyeings. The dyeings resist the action of light and stoving; neither acids nor alkalies affect them at all.

The Golden Yellow on worsted yarn in recipe 19 is one of the fashionable colors in demand, produced by the use of alizarine colors, furnished by C. Bischoff & Co., New York, which can also be used for one-dip fast colors by a special treatment, which can be easily ascertained upon application to this house. This concern also shows another color in recipe 22, being a red shade of brown on cotton cloth, obtained by the use of Direct Brown V X.

There are three samples of blue on cotton, appearing in our recipes 20, 25 and 27, obtained by the use of different brands of Vidaline Blue, furnished by Sykes & Street, New York. We feel confident that these colors will be greatly admired. The one in recipe 20 is of a lighter shade than that appearing in recipe 27. The one in recipe 25 is used in connection with Fankhausine, manufactured by the Nashoba Co., Ayer, Mass., which is, or should be,

too well known by dyers for any comments upon its merits by us.

There are two recipes, one showing a light blue (21) and another showing a dark blue (24) on cotton yarn, produced by the use of Diamine Azo Blue 2 R, supplied by Wm. J. Matheson & Co., Ltd., New York. This color is dyed upon cotton with calcined soda and calcined Glauber's salt. It can be diazotised and developed with Beta Napthol, Naphthylamine Ether N, or Fast Blue Developer A D. The shades produced are of a full blue color, slightly redder than those obtained from Diamine Azo Blue R, and also possess superior fastness to light. It is exceedingly well adapted for mixtures with Diaminogene Blues, in order to obtain colors which are fast to washing and light. It is as easily discharged as Diamine Azo Blue R.

The Farbenfabriken of Elberfeld Co., New York, are represented in recipes 23 and 29, black and navy blue respectively, on wool. The first shows a good one-dip black on wool, which possesses great fastness. It is claimed to be very fast to milling, exceedingly fast to light and air, and in many respects superior to logwood. It can be used for any class of worsted or woolen work. In a scouring solution the shade remains unchanged. There is a faint dull red color extracted in the scouring solution, and white yarn plaited with it and scoured in the same solution is not stained, showing great fastness to scouring and fulling. The company representing this color have published an interesting card, showing yarn dyed in this way with Diamond Black, and then woven with white cross threads. The piece has been fulled, and the purity of the white cross threads show the fastness of the black. Recipe 29 shows a good shade of navy blue, and one that is easily dyed. The shade produced is very full, and is claimed to be equally fast to shades produced with alizarin. It is good as a self color, or can be used in combination, producing a variety of compound shades. In a scouring solution the shade remains unchanged; the scouring solution is not colored, and white yarn plaited with it and scoured in the same solution is not stained, showing great fastness to scouring and fulling.

The Golden Yellow on cotton seen in recipe 28 is a color which dyers will appreciate, as obtained from Extract Fustic 51°, furnished by the Stamford Mfg. Co., New York. We call attention to the comments made by our dyer.

The Fast Black on cotton yarn noticed in recipe 31, obtained by the use of Diphenyl Black, furnished by John J. Keller & Co., New York, will be admired by those in want of such a color on cotton. It will be seen from our dyer's remarks that this black is obtained by the use of only six pounds of the color. It is of especial interest to dyers, owing to the solubility of the product, and to the brilliancy and fastness of the shades produced with it. Dyed cotton woven with white will hardly bleed in fulling. Besides this, the shades are fast to acids, making the dyestuff very valuable for cross dyeing. Owing to its penetrating power, the dye is very adaptable to dyeing cotton in the cop and on the bobbin. We show in recipe No. 30 a reproduction of recipe No. 13 that appeared in our January issue, being a drab on cotton yarn, produced by the use of only six ounces of Fast Diphenyl Black. We reproduce this recipe on account of a typographical error that appeared in No. 13, in which it was stated that six pounds instead of six ounces, were used. Dyers will please note this correction.

Hæmatoxylin.

The coloring matter of logwood was first investigated by Chevreul in 1811, who obtained from it two bodies, the chief being a yellowish white crystalline body, which, on exposure to air in the presence of a trace of ammonia, rapidly darkened in color. To this body Erdmann later gave the name hæmatoxylin, by which it is now known.

It is uncertain whether hæmatoxylin exists in the growing wood, but it is certainly present in large quantities in the freshly chipped or ground wood, of which a good sample of logwood may contain 8 to 10 per cent. It may be obtained by extracting freshly cut logwood with water containing a little sulphurous acid, and crystallizing from the solution thus produced; or more readily by extracting the dry, freshly-cut wood with ether, evaporating to a syrup, then adding a little water and allowing the solution to stand until hæmatoxylin crystallizes out.

GLOBE DYE AND BLEACH WORKS.

The Globe Dye & Bleach Works.

The business of the Globe Dye & Bleach Works, Frankford, Philadelphia, was established August 1, 1865, at the old Globe Mills' canal, below Third St., by R. Greenwood & Co. It was afterwards moved to its present location August 1, 1867, when the firm became R. Greenwood & Bault. The business grew steadily, from the commencement, every year, until 1893.

The present capacity of the plant is 50,000 to 60,000 pounds of cotton warps and skein yarn per day. Its steam plant consists of 10 boilers of 90 h.p. each. It employs, when in full operation, about 160 men. Its machinery consists of warp and skein dyeing machines; 5 sets of drying cans, each having 18 cylinders 144 inches long; 3 improved Butterworth skein drying machines of a capacity of 6000 pounds each, or 18,000 pounds in 10 hours. Its water supply is taken from an artesian well, with the advantage of always having clear, sparkling water. The capacity of the well is 300 gallons per minute. The business of the firm is, and has always been confined to the dyeing and bleaching of cotton in either warp or skein, and in this line it claims to do a larger trade than ony other one concern in this country.

Roundabout Notes.

Prudhomme discovered that an adjective dye is formed by the action of glycerine and sulphuric acid on nitro-alizarine, which came upon the marke

as the insoluble Alizarine Blue GW and R. These are of special interest as dyes for wool with a mordant of chromate and tartar. The Elberfeld firm now offer soluble products made by the action of sodium bisulphite, which are of great importance for cotton printing, as they give shades fast to light, soap and chlorine. Alizarine Blue S develops with a very short steaming, and gives beautiful blue lakes with chrome, nickel and zinc. The printing colors should be used fresh, as they soon lose intensity and in time become quite grey. Many practical men add a little bisulphite to the printing color, as well as a little potassium rhodanate, to paralyze the action of any iron which may be present upon the alizarine blue.

* * *

Alizarine blue requires unprepared blue for its development. On oiled goods, the chrome lake precipitates paler and greener, while on unoiled stuff the blue has a beautiful reddish tinge. As the value of the S marks of alizarine blue culminates in their solubility, and readily break up on steaming, it naturally follows that this decomposition must be avoided in making the printing color, and must happen only in the steaming after the printing. Hence, Alizarine Blue S in paste or powder must never be mixed with hot water or hot thickening. It dissolves quite rapidly in those liquids when cold. The best thickening is made of wheat-starch and tragacanth, with or without olive oil.

* * *

The experiments made this year in England, on the fastness of dyes seem to have lead to some rather unexpected results. The brilliant alizarine blues dyed on chrome-mordanted wool are reported as very fast, which is remarkable, as they belong to a group of coloring matters not noted for fastness. It must be noted that they are not alizarine (oxy-ketone) colors. Of course the fastness of the alizarine (oxy-ketone) blues is proverbial, and they are very worthy competitors with indigo in this respect. The principal difference is that time generally gives the alizarines a reddish tint, whereas the indigo retains its bronzy blue.

* * *

A new textile prepared from gelatine is patented in Germany. The gelatine is dissolved, in hot solution of bichromate of potash, the action of the bichromate being to render the gelatine insoluble in water after exposure to light. The solution, having the requisite consistency, is placed in a vessel, the bottom of which is provided with a number of fine apertures, and is forced through these by pressure into threads. The threads (filaments) are fed on to a revolving drum, the speed of which can be regulated, and from the drum they pass on to an endless band, from which they can either be reeled separately or several thrown into one thread as in the case of silk yarn. The strength and the pliability of the filaments can be varied by the addition of suitable quantities of glycerine, castor oil, etc., to the original solution. The latter can also be dyed by the addition of finely-divided colors or color extracts.

* * *

A fine and perfect black on slubbing has always been a desideratum. One of the finest procurable seems to be got with diamond black. A mixture of 2 1-2 pounds of Diamond Black GA and 1 1-4 pounds of Diamond Black NR, dyed in a boiling bath with 3 1-2 pounds of acetic acid to each 1 1-2 pounds of bichromate of potash and 1-2 pound of sulphuric acid, added after the dye bath is exhausted with another half hour's boiling, gives a brilliant black which seems to be equal to the fastest logwood black in every respect, with the additional advantage that frequent washing and continued wear do not turn it green.

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Tape Manufacturers.

Editor Textile World:

Will you kindly give us the names of tape manufacturers in the United States?

England. COOP. K. M. C.

[We refer our correspondent to our advertising columns in answer to his inquiry. See Buyers' Index, "Tapes and Braids."]

Wool Importation.

Editor Textile World:

Will you give me the amount of wool imported in 1896?

Providence. X.

[The number of pounds of wool imported in 1896, was 159,776,015.]

Skirt Wire.

Editor Textile World:

Can you inform me where I can obtain skirt wire? Give me the name of some manufacturer.

Iowa. IONIA.

[Write to Robert N. Bassett, Birmingham, Ct., and Washburn & Moen Mfg. Co., Worcester, Mass.]

Rubber Thread for Suspenders.

Editor Textile World:

Will you kindly give us the name of a firm manufacturing a fine rubber thread such as is used in suspenders, garters, etc.?

MICHIGAN.

[We have answered by letter. The article can be obtained from the Revere Rubber Co., Boston, Mass.]

Supplies for Clothing and Shirts.

Editor Textile World:

Wishing to start in the clothing and shirt manufacturing business as soon as possible, I ask if you will kindly advise me by letter, of jobbers where I can obtain cloth and trimmings in quantity, not exceeding $500. I want jobbing houses that handle mixed goods, cheap woolens, worsteds and cottons.

S. A.

[We have answered by mail.]

Terms Used in Manufacturing.

Editor Textile World:

Is there a book, not an expensive one, that will furnish me with information concerning different terms applied to yarns, threads, twine, warp, etc., for example "chain warp," "combed or carded cotton yarns," "chains and skeins," etc. Also the terms connected with cotton yarns and threads for winding on spools for hosiery purposes, etc. In other words, I want a dictionary of the terms used in the manufacture of cotton, wool, knit and other goods. Also the meaning of terms used in quoting prices, as noted on page 117, December number of the TEXTILE WORLD. What is understood by double roving white cop yarn, 11s and 12s, 2/40s, 20/1, 26/1 soft, 20/2 medium, 8/3 carpet? I would also ask if there is some book which tells how the different numbers of thread are obtained, and if there are tables giving the length of the different sizes per pound.

Fairfield Co., Ct. J. B.

[Our correspondent stands in great need of a good book on cotton manufacturing and of a good textile journal. We would advise him to obtain a book, entitled "Cotton Manufacturing," by C. P. Brooks. The price is $2. He will find in this book chapters treating on warp yarns, winding, warping, calculations, yarn counts, and a glossary of technical terms. We will send him a pamphlet of yarn tables, prepared by W. S. Kelly, which should help him. We should also advise him to obtain "Textile Calculations" by E. A. Posselt. Price $2.00. Also "Wool Manufacturing," by R. Beaumont. Price $2.35. The book "Woolen Superintendent's Guide," by Charles Green is a good one for him. Price $4.

In regard to the terms he refers to, used in our market reports, we will say that "double roving white cop," refers to yarns spun on the mule from two strands of roving. We assume that he knows what roving is, it being a product of the machines intermediate between the drawing frame and the spinning machine. Such expressions as "20/1" means simply No. 20 single yarn. This might be expressed as 20s. 2/40 means two threads of No. 40 yarn twisted together. 20/2 means the same thing, and reads No. 20 two fold.]

Finding Counts of Yarn.

Editor Textile World:

Will you kindly favor us with the name of a machine whereby we can get the correct number, size and count, cut or run, of cotton, woolen, worsted and silk yarns, and place where we could purchase same.

Pennsylvania, SEAMLESS HOSIERY.
Jan. 29, 1897.

[The only device we know of by which you can ascertain this without calculation, is Guild's Universal Yarn Beam, by which you can ascertain from a small sample (from a few yards upwards), the size or count of any kind of yarn, provided you have the proper weights for the kind of yarn you are testing. The cost of the yarn

beam equipped with weights for one kind of yarn only is $10, and $1.00 is added for each kind of yarn for which weights are required. Mr. Guild of the TEXTILE WORLD, is the inventor of this beam, and a number of other time-saving testing devices. Guild & Lord used formerly to manufacture them, but they are now made by F. B. How. An order sent to us will have prompt attention at manufacturer's price.]

Paper Yarn for Hosiery.

Editor Textile World:

Can you give me the address or put me in communication with manufacturers of paper yarn for hosiery? We have seen several notices of hosiery being made of paper yarn, and we would like further information concerning it.

South Carolina. C. K. M.

[We have replied to the above by letter.]

English Wool Clip.

Editor Textile World:

Will you inform me of the number of sheep in England, and the amount of wool produced?

Boston, Mass. X.

[We give, in answer, the following:

	Sheep and Lambs. 1895.	Weight per Fleece. lbs.	Total Weight lbs.
Sheep and Lambs in 1895 . .	29,707,050		169,147,707
Slaughtered . .	10,953,416	at 3,	32,860,248
Net Clip of Wool in 1896 . .			136,287,459

Custom Work Wanted.

Editor Textile World:

Do you know of any mill that does custom work or will do such work as making yarn out of new and old woolen scraps? There are several large mens' furnishing and clothing factories in this neighborhood that furnish any amount of waste material. I want to use the yarn from the above material for making rugs.

Missouri, Jan. 22, '97. A. S.

[We think if our correspondent will communicate with some of the small mills in Missouri, that he will obtain all that he requires in the way of information, and would suggest his writing to such mills as the Carrollton Woolen Mills, Carrollton, Mo.; Louisiana Wool Fibre Co., Louisiana, Mo.; Pike County Woolen Manufacturing Co.; also Louisiana, West Plains Woolen Mills, West Plains, Mo., and particularly to H. L. Weatherford, Unionville, Mo.]

Heaters, Injectors and Damper Regulators.

Editor Textile World:

Dear Sir: Which will effect the largest saving in coal, an automatic damper regulator used in connection with an injector, or a pump and heater?

So. Weymouth, Mass. H. L. D.

[It is extremely difficult to answer this question, as there is no way of making the comparison. Both of these appliances are indispensable in a steam plant. The heater for its well-known economy, also the damper regulator, for the latter will handle the damper with far greater accuracy and economy than it is possible to do by hand. So far as the injector is concerned, it is considered more as a convenient appliance in a boiler room than anything else, few, if any, pretensions being made for it in the way of economy.]

Power of Levers.

Editor Textile World:

Dear Sir: I have a cube of iron weighing 500 pounds, and two levers, one 6 feet long, the other 7 feet 6 inches long. What will be the difference in effect if a weight of 100 pounds is hung on the end of each lever, the other end being placed under the cube, the fulcrum being in the same position each time?

Plantsville, Conn. S. W. M.

[1st lever, 6 feet=72 inches long. 2nd lever, 7 feet 6 inches=90 inches long. Place the fulcrum 15 inches from end of lever. Then with 1st lever, 72—15=57 inches from fulcrum to weight of 100 pounds. The principle of the lever is: The weight multiplied by its distance from the fulcrum, is equal to the power multiplied by its distance from the fulcrum. Then 500×15=57×100. 7500=5700. Manifestly it is not; therefore to make the second term of the equation equal the first term, either the distance (57") must be increased, or the weight (100 lbs.) increased.

With the second lever, 90—15=75 inches from fulcrum to weight. Then 500×15=75×100. 7500=7500. That is, under these conditions the cube of iron is balanced by the weight, 100 pounds. In the first case it was not.]

Book On Knitting.

Editor Textile World:

Is there any book published on the knitting business? X.

[There is no such book as our correspondent describes. The only book that approximates his wishes, as we understand them, is one by William Felkin, published in 1867, entitled "History of the Machine Wrought Hosiery and Lace Manufactures." This is an English work, and would be of very little practical use in the mill. The only place for information on such a subject is what is contained in the textile journals of the day.]

Cost of Dyeing Skein Yarn.

Editor Textile World:

Will you please give me the ordinary average cost of dying skein yarn per 100 pounds, outside of dyestuffs, for power, steam, water, labor, etc.

North Carolina. J. K. C.

[Only a general reply can be given to the above query, as the cost of the several elements given vary in different mills

and localities, according to their facilities, as some mills have hard work to get water, while some have abundance. Some of the cities pay high wages, while those in the country towns pay next to nothing. The average sum, perhaps, might be set as ranging from one to one and a half cents per pound.

Our correspondent, it will be noticed, does not mention whether he wants the information for woolen or cotton yarn. We presume it is for cotton, but we will answer as well as we can so as to cover both items. Of course, the cost of dyeing would depend somewhat upon the depth of shade wanted, also what dyestuffs are used, whether Direct or Basic. The above average cost we give as applied to cotton yarn. For woolen yarn, the cost will average about the same. The following prices are what the dyers in the large cities estimate as covering the cost, per 100 pounds:—35 cents, labor; 35 cents, steam; 30 cents, drying; and 30 cents, wear and tear, of righting bad patches, etc. Total, $1.30.]

Fine Scales.

Editor Textile World:

Will you please send us the name of some firm that deals in scales, as we are in need of some fine weighing scales.

Yours truly, Rutter Bros.

Lakeport, N. H., Jan. 29, 1897.

[We think from your inquiry that you mean yarn scales, for ascertaining the counts of yarn. If that is what you want, we can supply you with a beam for weighing yarn, to give you either runs or cuts, to cost $5, or you can get one of Guild's universal yarn beams, which will enable you to ascertain the size or count of any kind of yarn on the same beam from a small sample, and cost about $13. If you want ordinary fine grain scales, we should refer you to Henry Troemner, of Philadelphia, or Fairbanks, of Boston.]

Machine for Cutting Cloth Samples.

Editor Textile World:

Will you please inform me where we can purchase a machine for cutting cloth samples, preparatory to mounting on cards. We have one in mind that costs in the vicinity of $25, but do not know the name of the maker. If you can give us any information in the matter, you will greatly oblige,

Yours truly,

B——Mills, G. C. Supt.

Mass., Jan. 29, 1897.

[We have sent you by mail the address you ask for. We believe the machine costs a little more than the sum you state, but it is the best, and indeed the only one we know of that is adapted for that purpose, being built by a well-known woolen manufacturer, who realized the need of such a machine in his own business.]

Bleaching with Peroxide of Hydrogen.

Editor Textile World:

Can you favor me with a formula for bleaching woolen goods with peroxide of hydrogen?

Mass., Jan. 21, '97. J. B. T.

[We give two formulas. They are both reliable formulas, the difference being that one operates much faster with increased cost, than the other; but in small lots, for occasional bleaching, where the bleaching is not continued every day, the latter is preferable. In all cases the bleaching should be conducted in a perfectly clean wooden or crockery vessel, free from all metal attachments except lead—lead is not harmful to the solution and where fittings are required they should be made of that metal.

A bath is prepared of water, 60 parts; peroxide of hydrogen, 10 parts; silicate of soda, 1 part;—all by weight. The water should be heated to about 175° with live steam, the peroxide of hydrogen then added, and the silicate of soda, previously dissolved in a pail with hot water, added next. The scoured goods are entered into this bath and allowed to remain from six to twelve hours, or over night, taken out the next morning, passed through wooden or rubber rollers, to save all the liquid in the bath possible, passed through a light sour, rinsed and done. For succeeding operations, this same bath is used, with the addition of about one-half the original quantity of peroxide of hydrogen and silicate of soda first used, heating the bath with live steam from a rubber hose before the addition is made, a second batch of goods entered, and the operation repeated until the bath becomes too dirty for further use, when a new bath is prepared. The proportion of peroxide of hydrogen and water used can vary according to the condition and quality of the goods to be bleached; more or less peroxide of hydrogen can be used with silicate, in the proportion of about one to ten, that is, if 100 pounds of peroxide of hydrogen were used in one bath, add ten pounds of silicate of soda; for ten pounds of peroxide add one pound of silicate of soda. This process is a good process for continuous work, where bleaching is done every day.

(2.) Another process which will give equally as good results, but which will be somewhat more expensive, is to prepare a bath, in a wooden or crockery vessel, of water, 60 parts; peroxide of hydrogen, 10 parts, ammonia, sufficient to make the bath smell fairly strong of ammonia gas. The bath in this case is not heated above 100°, and should be heated before the peroxide and ammonia are added. The scoured goods are entered into this bath and allowed to remain for from five to ten hours, taken out, rinsed in clean water, and done. The bath will be nearly or quite exhausted by such operation. As

in the other case, it can be made stronger or weaker, according to the condition of the goods; in some cases, as weak as one to 15 or 16 of water will give the desired results; in other cases, again, even the pure peroxide can be used where the goods will stand the expense, or where they are dark, like browns. Peroxide of hydrogen will not bleach artificially colored goods, but will bleach any of the natural colored fibres. The amount of ammonia to be used is about one-half to one ounce to one gallon of peroxide of hydrogen. In handling the goods no iron forks, or other metals, barring lead, should be used, and the mechanical arrangement can be made to suit the conditions of the work to be done. All that is necessary is to get an alkaline solution of the peroxide of hydrogen, in greater or less strength, in contact with the goods. The bleaching is effected very evenly and effectively, and the results are permanent. The bleached goods take dyestuff, and are in no way injured by the treatment.]

Publications Received.

—QUARTERLY JOURNAL OF ECONOMICS FOR JANUARY, 1897. Published for Harvard University, by George Ellis, Boston, Mass. This quarterly has many timely articles, the contents of which are as follows: The Old Generation of Economists and the New; Currency Discussion in Massachusetts in the Eighteenth Century; A Fore-runner of Bohm-Bawerk, and Social and Economic Legislation of the States in 1896.

—TRANSACTIONS OF THE NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION. Semi-annual meeting, September 22 24, 1896. The report of the semi annual meeting of this association, held at the Profile House, White Mountains, has just been published in book form, of 359 pages. It contains an immense amount of valuable information to the cotton manufacturer. The price of the Transactions is $3 per volume to non-members, and $1 to members for extra copies, in addition to the one to which they are entitled as a part of the privilege of membership.

—TEXTILE MANUFACTURE AND DRY GOODS TRADE DIRECTORY. Published by C. A. Dockham & Co., 131 Devonshire St., Boston. The 16th edition of this directory has just been issued. This directory has been well known to the trade for the last thirty-one years, and the present edition is fully up to its high standard. It is conveniently arranged for ready reference, and its typography is excellent. The directory embraces the cotton, silk, wool, jute and linen manufacturers of the United States, Canada and Mexico. According to the statistics derived from this directory, there are in the United States 18,753,935 spindles, against 17 126,418 spindles in 1894, showing an increase of 1,627 517 spindles. The number of sets of wool cards is placed at 8242, against 8111 in 1894, and 1291 worsted combs, against 1148 in 1894. The price of this directory is $6.

—GREENE ECONOMIZER. Published by the Fuel Economizer Co., Matteawan, N. Y. This is a pamphlet of about eighty pages relating to Greene's fuel economizer for steam boilers, the sole makers of which, in the United States, is the Fuel Economizer Co., of Matteawan, N. Y. There is probably no adjunct in connection with the working of the stationary steam boiler, whose economical value is more generally recognized than that known as the economizer or feed water heater made by this company. The apparatus, in the main, consists of a stack of tubes arranged vertically in the flue leading from the boiler to the chimney, and designed to utilize the waste heat in the gases passing off from the furnace. The catalogue is fully illustrated showing the various positions and uses recommended for this economizer.

—We are in receipt of a handsome calendar from the Dinsmore Manufacturing Co., Salem, Mass., manufacturers of factory sewing machines and supplies for textile mills. A half tone engraving appears on the calendar, entitled "Spinning a Yarn," illustrating a number of sailors resting upon the ship's deck, telling and listening to stories.

—SHELDON'S RETAIL TRADE DIRECTORY for 1897. Published by J. D. Sheldon & Co., Lawrence Building, Leonard St. and West Broadway, New York. This is a directory of some of the principle houses in the retail trade of the United States dealing in dry goods, notions, etc., arranged according to states and cities, giving location of office in New York, and names of resident and department buyers.

—APPLETON'S POPULAR SCIENCE MONTHLY for February, 1897, takes the occasion of the recent completion of the synthetic philosophy, to publish an appreciative account of Herbert Spencer: "The Man and His Work," by Prof. William Henry Hudson. Prof. William Z Ripley begins in this number a series of papers on "The Racial Geography of Europe." Of ethnological interest also are the articles on "Indian Wampum Records," by the late Horatio Hale, and the illustrated account of "Some Primitive Californians," by Mary Sheldon Barnes. David A. Wells writes this month on "The Sphere of Taxation of the United States Government," showing how it limits the taxing power of the individual States. W. S. Blatchley tells "How Plants and Animals Spend the Winter," pointing out the ways they have of avoiding or protecting themselves against the cold. New York: D. Appleton & Company. Fifty cents a number, $5 a year.

—PHILADELPHIA BUSINESS DIRECTORY for 1897. Published by the C. F. Howe Company, Philadelphia. This directory has appeared with its usual promptness at the beginning of the year, having been canvassed for, compiled and printed in a little over three months, thus presenting information that is fresh and up to date. The usual characteristic features are retained, such as officers of corporations, private addresses, etc.

Removing Steam from Finishing Sheds.

Devices are now placed in all modern factories for proper ventilation, consisting chiefly of fans by which the air in the rooms in which operatives are at work is being constantly changed. This scheme is being carried still further in some modern factories, by which steam is removed from finishing sheds and dyehouses. We have through our English exchanges, particulars of an air warming completed at one of the large bleaching and finishing works at Ballington, England. The sheds where this installation has been placed contains the usual finishing machines, such as starch mangles, drying machines, etc. A considerable amount of steam is given off during the various processes, especially that of dry-

ing. The removal of steam from the vicinity of the drying machines is provided for in the first instance by two 36-inch fans, placed immediately above them, but the shed being of large extent and steam rising from other processes, these fans alone prove inadequate, consequently in cold and damp weather steam hangs about in the shed, condensing on the ceiling and roof and dropping on the goods below. Accordingly, a tubular heater is installed for warming the air as it enters the shed. The consequence of this arrangement is practically the heating of all of the incoming air on one side of the shed, and its passage out on the other side by means of fans, the air in the shed being kept constantly heated and changed. The installation in question is thought to be the first of its kind, and, so far, it is reported as proving eminently satisfactory.

Wool Drying Machine.

Methods for drying wool are more complicated than those existing fifteen or twenty-five years ago. Notwithstanding the apparent simplicity of drying wool, it is an operation that should demand great care and judgment. To-day, appliances of an expensive kind are required for producing the necessary current of air through the machine in which the wool is dried, while it is equally important to assist in conveying the wool along in a free and open state as it is being dried. A new machine has been invented provided with a powerful fan which forces a blast of air through a tubular heater containing about 160 tubes. The heated air then ascends a flue into the uppermost chamber. The wool is fed to the machine by a travelling lattice and a pair of feeding-rollers, and as it enters it is met by the ascending blast of air, and is carried on to the uppermost one of a series of smooth, perforated plates. These latter consist of a number of plates, resting upon rails extending across the machine, and suspended at each end by links. The plates are each made to swing longitudinally by means of cams, driven at the end of the machine, and the movement given thereto, with the addition of a current of air, has the desired effect of conveying the material along in as gentle a manner as possible. The trays are purposely left short at each end alternately, so that the wool falls from one to the other, until it arrives at the egress point of the machine, where it is discharged in a dry and open state.

Press Papering Machine.

There has recently been placed before English manufacturers a machine for inserting press papers between the folds of cloths preparatory to pressing the same. This seems to be a returning to the old methods of pressing cloths, which have been more or less discarded by the use of the rotary press machine; still, this method of pressing has its important features which the rotary does not fully cover. The hydraulic press is not a valueless machine by any means, when high finish and lustrous effects are desired. As is well known to our manufacturers, the common method of inserting press papers between the folds of cloth is done by hand. By this new mechanism, the same operation can be done by machinery. A number of attempts have been made in this direction, but until now nothing has been successful. The first practical use in the factory of this machine was made about two years ago, by a large manufacturing concern in England, which, strange as it may seem, at this end of the nineteenth century, found it necessary to make the machine in a special room under lock and key, on account of the opposition of the hand pressers.

Change in Price.

Editor Textile World:

After Feb. 1, our price for the dye-stuff sold under the names of "Fast Violet B," "Gallo-Cyanine," and "Victoria Violet Blue" will be 17½ cents per pound.

Our article is in every way equal to that offered by our competitors, and as it was entirely due to us that the price was reduced in the first place, owing to the fact that the patent suit that was instituted against us was finally decided in our favor, we feel that we are entitled to some consideration in this matter.

Victor Koechl & Co.

New York, Jan. 28, 1897.

Philadelphia's New Dyeing and Finishing Plant.

The dyeing and finishing works of Joseph R. Foster & Son, Philadelphia, which have been in process of construction for several months, were opened for business on the 12th of January. Orders have been taken thus far for dyeing only, the finishing department being not yet ready for business. The senior member of the firm, Joseph R. Foster, is well known to the dyeing trade as a late member of the firm of Firth & Foster Bros., who, after many years experience in the trade, possesses a complete mastery of the dyeing and finishing business. His sons, Frank, and John W., also of the new firm, were reared in the same school and are consequently thoroughly trained in their specialty. The new works are located on 2nd Street, at the junction of Clearfield and Lippincott Sts., Philadelphia, and occupy a commanding position close to the Reading R. R., and in loading proximity to a proposed station of that road. The reservation covers an acre and a quarter. The buildings are red brick and are constructed to admit of extensions and additional stories. They are L shaped; one wing being 180 by 50 feet, and the other 150 by 50 feet. A boiler house, 30 by 40 feet, is located apart from the works. The dye house is supplied with the Klauder-Weldon machines, tanks and other modern equipments. The motive power is a Corliss engine built by Robert Witherill & Co., 125 h.p., and a Berry safety boiler, 250 h.p. The special work is dyeing yarns, slubbing and raw stock, and finishing. The offices are commodious and handsomely finished. It is safe to predict abundant success for the new firm, who have prepared for the trade such substantial and finely appointed works.

Knitting Machine Needles.

H. R. Stoops & Co., Philadelphia, agents for the Excelsior Needle Co. and National Needle Co., announce their business in our advertising columns. They handle knitting machine needles and sewing machine needles in great variety, and exclusively for manufacturing uses. They supply knitting needles to many of the well known machine builders in Philadelphia and the Middle States, and have a convenient depot of supply at 66 North 4th St., Philadelphia. In their card will be found enumerated, also, parts of sewing machines, oils, beltings, etc.

Henry Riehl & Son.

We are pleased to present elsewhere the card of the old and popular machinery firm of Henry Riehl & Son, Philadelphia. With an extensive clientage in every manufacturing centre of the United States, they have become well known as builders of power looms for tapes, bindings, gimps, etc., Jacquard machines of all kinds, and piano card stamping machines. Other important features of their production are circular shuttle buttons for silk ribbons, and fine index Jacquards. In a later issue we will illustrate the Riehl 600 needle double cylinder Jacquard. The senior and founder of the business, Henry Riehl, is known for his practical knowledge of his especial work, while his son, being trained in every department, is a thorough master of machinery.

Krout & Fite Mfg. Co.

The Perseverance Mills, of Philadelphia, operated by the Krout & Fite Mfg Co., begin the year with a full pay-roll of help, and increased factory equipment. Probably no narrow fabric and lace edging works in the country, have had a steadier run of orders during 1896. Their spring samples were ready for the early market and received the flattering approval of the trade. These have been followed by a fall display for 1897, which in the opinion of the company, are of superior excellence to all former offerings. The variety is more extensive; a natural result of their late increase in machinery. Spool tapes continue a specialty with the company in connection with their silk and cotton narrow fabrics and lace edgings for ladies' jersey ribbed underwear.

—The Crossingham Knitting Mills, Germantown, Pa., have recently added to their plant ten new Nye & Tredick knitting machines; also a new bleaching plant, and have added to their works a new dye house. This gives the concern one of the finest equipped plants of the kind in its neighborhood, for the manufacture of ribbed underwear. The mill has recently received some large orders for goods from some of the largest concerns in this country. The proprietor is a practical manufacturer, having been in the knitting business for thirty years. The mills were not stopped a single day for want of work during 1896.

—Porter Bros. & Co., manufacturers and commission merchants, New York, have been appointed sole selling agents for the Wiley Maunfacturing Co. of Catskill, N. Y., which, in connection with their large line of underwear, is one of general attraction and merits the attennon of buyers.

—Wm. J. Matheson Co., Ltd., Brooklyn, N. Y., have filed a bill in equity against the Hanna-Schoelkopf Co., of Philadelphia, for an alleged infringement on a patented improvement in blue black dyes assigned to the plaintiff.

—The Enoree Mfg. Co., Enoree, S. C., who are making alterations and extensions in their present mill have placed their order for drawing frames, slubbing and intermediate frames with the Howard & Bullough American Machine Co., of Pawtucket.

—The Tremont & Suffolk Mills, Lowell, have placed another large repeat order with the Howard & Bullough American Machine Co., Pawtucket, R. I., for their patent revolving flat cards.

—Sykes & Street, importers of anilines, dyestuffs and chemicals, removed their Boston office Feb. 15th to 94 High St.

—B. A. Dobson, of the well-known firm of Dobson & Barlow, Bolton, England, has recently been the recipient of a beautiful lacquered screen and cabinet, all in one piece, as the present of a number of gentlemen connected with the cotton industry in Japan, as a pleasing souvenir of his late visit to that country. The piece of furniture is made out of an especially hard Japanese wood, and apart from its artistic appearance, is remarkable for its solidity and stability. Mr. Dobson was also presented with an address containing the signature of no less than 58 Japanese gentlemen connected with the cotton industry, the text of which was written in legible English on a scroll of parchment attached to an ivory roller.

—The Mount Vernon Boiler Co., Baltimore, who are making extensive alterations in one of their large mills, have placed their order for picking machinery, eighty-four revolving flat cards and necessary drawing with the Howard & Bullough American Machine Co., Pawtucket.

—There appears in this issue an advertisement of a Western knitting concern that desires to obtain additional capital or a loan of money upon excellent security. Parties desiring to know more about this mill can obtain the necessary information by writing to us. We will briefly say that the mill is built on the New England slow burning plan, on which an insurance of $100,000 can be carried in the New England Mutuals. It looks to us as if the opportunity was a rare one for anyone who desires to make an investment of this kind.

—The Board of Government of The New England Cotton Manufacturers' Association have decided to hold the annual meeting of the association at Boston on Wednesday and Thursday, April 28th and 29th. A number of papers have been arranged for the meeting and the list is nearly completed. There are a number of propositions for membership, but action will be deferred until shortly before the annual meeting. During the year the association has issued to the members two volumes of transactions comprising 627 pages.

—Hy Hentz, of New York, believes that the New England mills are not stocked with cotton beyond the 15th April next. They have, he says, not been encouraged to buy much, in consequence of the difficulty in selling goods. The feeling in Boston is that the mills are fairly well stocked till into June.

—Printed forms of application for admission to the Lowell Textile School, Lowell, Mass., can be obtained of C. P. Brooks, director of the school. Those desiring to take advantage of the opportunities offered by this school should write to Mr. Brooks, stating their wishes.

—The Berkeley Co., Berkeley, R. I., are now receiving shipments of roving frames built by the Howard & Bullough American Machine Co., Pawtucket.

—The closing year was less favorable to the German textile than to other trades; this was partly due to disappointments concerning exports. The cotton trade, however, did a very good business, and many new spinning and weaving establishments have been started. Imports of English cotton thread are constantly declining. The wool trade was favorably situated. Linen and jute also make good reports. The starting of a new jute-spinning concern led to the dissolution of the convention. The silk trade suffered, chiefly through the shrinkage in the American business.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Greenville. Declarations for incorporation of the Wellchester Mills have been filed, and commissioners appointed who will open books of subscription. The petitio ers are J. H. Dunklin, R. A. Beeland, H. Lee Brown and R Y. Porter. This is the proposed cotton mill heretofore mentioned in the Textile Advance News. The capital stock is $100,000, payable in weekly installments.

—*Alabama, Montgomery. Concerning the report that the Tallahassee Falls Mfg. Co. were making preparations for enlarging their cotton mill, we have the following authentic information: They will build a new mill in the spring. The class of goods to be manufactured has not yet been decided upon. The mill will contain 20,000 spindles and be run by water. It will be located on the opposite side of the river from their present plant. C. R. Makepeace, Providence, R. I., engineer and architect, will draw the plans for the new plant. This company has a capital of $500,000.

—*Florida, Jacksonville. The American Manufacturing & Commercial Co., wh ch we recently reported organized here, informs us that they have erected a new building, in which they will manufacture cotton rope. They will employ about 50 hands at the start, which they intend to make some time in April, 1897. 2000 new spindles will be installed together with 15 cotton cards. The motive power will be steam. This company is now proposing to issue bonds to the amount of $40,000, predicated upon its plant, and $70,000 worth of Jacksonville real estate, to run for twenty years, bearing 8 per cent. interest, principal and interest payable in gold. Any communications for this company should be addressed to M. J. Christopher, secretary.

—Georgia, Atlanta. H. A. Rucker, H. M. Turner, W. A. Pledge, W. J. Gaines and others (colored), will organize a $25 000 stock company for the purpose of erecting and operating a cotton mill in Atlanta.

—Georgia, Carrollton. Some of the prominent men in this place are interesting themselves in a movement for the establishment of a cotton mill.

—Illinois, Chicago. A company to be known as the Western Shade Cloth Co. has been organized with a capital of $20,000. They will manufacture shade cloths and window shades. Benjamin F. Chase, Harvey Lantz and Chas. M. Holt are the incorporators.

—*Massachusetts, Leominster. Concerning the projected spinning mill which we reported with R. H. Morrill at the head, we have the following additional information: If the project goes through, and the prospects are good that it will, they will be in the market for a full equipment of machinery, including one 150 h.p. engine, and boilers, for a 5000 spindle plant. Fine cotton yarns will be manufactured.

—New Jersey, Union Hill. Concerning the new A. J. McIntosh Manufacturing Co., that we recently reported as being incorporated here, they now inform us that they will build an addition to an existing building, in which they will employ 50 hands. They will manufacture down quilts and cotton comforters. They will install three new sets of woolen cards. The motive power will be steam. A. J. McIntosh is president, and J. H. McIntosh, treasurer. They will have a New York office at 484 Broome St. They are now in the market, and will be pleased to receive prices on architectural iron work.

—New York, Patchogue. We have a report from Patchogue to the effect that negotiations are in progress for the purchase of 15 lots of land, on which it is proposed to erect a lace factory. According to the report, the syndicate interested in the transaction proposes to expend $200,000 in the factory alone.

—Rhode Island, Westerly. The construction of a new factory to be employed in the manufacture of fine cotton goods, on the Stonington side of the river, is contemplated.

—South Carolina, Charleston. A new company, to be known as the Leaview Cotton Mfg. Co., has been incorporated with a capital stock of $100,000.

—South Carolina, Columbia. It is reported that a cotton mill is to be erected in this place by New England capitalists, headed by the B. B. & R. Knight Co., of Providence, R. I., who will erect a cotton mill to contain about 75,000 spindles.

—*South Carolina, Seneca. Concerning the Hamilton Mfg. Co., which we recently reported organized here, we have the following information: The capital stock is $50 000. They will erect a new mill of about 2000 spindles, and equip the same with the latest improved machinery. The mill will be built with a view of doubling the capacity within a short time. They will manufacture seine twine and rope.

—Virginia, Suffolk. Concerning the knitting mill that we reported was contemplated for this place by J. Elliott Rigg, of Newcastle, Del., Mr. Rigg now informs us that a weaving mill is now being contemplated, but that nothing definite has yet been settled.

Enlargements and Improvements.

—Georgia, Augusta. Some improvements are now being made at the Isaetta Cotton Mills, and others are contemplated in the near future.

—Georgia Dalton. The Crown Cotton Mill will probably be doubled in capacity this year. The mill now contains 10,000 spindles and 256 looms, together with other necessary complimentary machinery. G. W. Hamilton is president of this company.

—Massachusetts, Adams. The Renfrew Manufacturing Company are placing new looms in their so-called new gingham mill. The looms will be operated in the manufacture of fancy shirtings.

—Massachusetts, Amesbury. The Hamilton Woolen Company is making preparations for installing new spinning frames. The order for the same has been placed with the Lowell Machine Shop, Lowell, Mass.

—Massachusetts, Chicopee. The Dwight Manufacturing Company will install new spinning frames, the order for which has been placed.

—Massachusetts, Clinton. The Lancaster Mills are making some improvements in their plant.

—Massachusetts, Lowell. Concerning the report going the rounds to the effect that the Merrimack Mfg. Co. were about to erect a single story building, in which they would

manufacture corduroy and velveteens, we are officially informed that they are not erecting a new building, but that they are re-arranging and adding to their corduroy, velveteen and finishing plant, which class of goods they have been manufacturing for a number of years.

—Massachusetts, Lowell. The Tremont & Suffolk Mills Company has recently placed an order for revolving flat cards.

—*North Carolina, Charlotte. Concerning the enlargement of the Louise Yarn Mill, which we reported would be made, we have the following additional official information: Work on the addition will be commenced May 1st, and it is the intention to begin operations in the same June next. When completed these mills will employ a total of 300 hands. Print cloths or their equivalent will be manufactured. They will contain a total of 15,000 spindles and 450 looms. The future name of the company will be the Louise Cotton Mills. The capital is $200,000. H. S. Chadwick is president, and W. S. Malley, treasurer. At present the mill contains 6000 spindles, but no looms.

—*North Carolina, Graham. The addition to the Oneida Cotton Mills has been completed, and looms to the number of 401 have been installed. It is said to be the intention of the company to increase to 1000 looms, in the near future.

—North Carolina, Statesville. It is quite probable that the management of the Statesville Cotton Mill may complete the equipment of their plant this year. The mill now contains 6000 spindles and 80 looms. At the time of placing the same it was understood that it was only a beginning.

—South Carolina, Clinton. The Clinton Cotton Mills have decided to increase their capital stock from $50,000 to $100,000, and have filed notice of their intention with the Secretary of State. This they do in order to increase their capacity, as we have previously reported they intended doing.

Mills Starting Up.

—Georgia, Brunswick. Mrs. Martha Mitchell, of Jacksonville, Florida, has purchased the cotton mill of the Kennon Manufacturing Company, of this place, paying $25,000 for the same. The plant contains 3000 spindles for manufacturing warps and yarns. Arrangements will probably be made for operating the factory in the near future.

—*Georgia, La Grange. The Dixie Cotton Mill has commenced operations.

—Kentucky, Dayton. Dr. Gus Goetze and others are said to be interested in a movement for leasing the idle Standard Rope & Twine Co.'s works, and starting them up in manufacturing another line of goods.

—Maine, Biddeford. Seventy-eight looms in the No. 3 Laconia Mills, which have been idle since last May, are now being started up on cotton flannels.

—Missouri, St. Louis. The South Broadway Merchants' Association are endeavoring to make arrangements with J. H. Hanhart, who represents a stock company, for reopening the old mills of the St. Louis Cotton Mfg. Co. Final arrangements are expected to be made at a meeting to be held in the near future.

—*Pennsylvania, Swathmore. The Wallingford Mills will be put in operation as soon as the building and machinery can be overhauled. In June last we reported these mills sold, on a foreclosure mortgage, to the mortgage creditor, Samuel G. Lewis, for $10,000. We are now informed that they have been re-sold, for $20,000, to the party who is now making preparations to start them.

—*Rhode Island, Centreville. The new engine at the Warwick Mills has been started up, and a small amount of machinery has also been started. Nearly all the machinery is now in the mill, and there is a good prospect that the mill will be in operation within a few weeks.

—Rhode Island, Hope Valley. The mills operated by Nichols & Langworthy Machine Co. have resumed operations, after being idle for six months.

—Rhode Island, Rockville. The cotton mill of the Briggs Mfg. Co. has been started up after a long idleness.

—Rhode Island, Warren. The Cutler Manufacturing Company are now running their mills full time till further notice.

—Rhode Island, Woonsocket. The Ray Cotton Co.'s mill, employing 125 operatives, has been started up on full time, after a six months' shut down.

Woolen.

New Mills

—California, San Bernardino. San Bernardino is said to stand a good chance of having a new woolen mill established in that place at an early date. J. V. Suman can give information.

—California, Ukiah. Messrs. Smith & Donohue are negotiating with a party who are said to be anxious to erect a woolen mill in this place, provided adequate inducements and location can be had. Should the deal go through, a mill with a capacity of from $100,000 to $500,000 of raw wool per annum will be erected.

—Connecticut, Stafford Springs. The looms in the Old Valley Woolen Mill, of Webster, Mass., have been shipped to this place, where they will be operated by the owner A. E. Ginburg, of Worcester, Mass., who is starting a small mill here.

—Louisiana, New Orleans. E. W. Douglas, of the Douglas Fibre Co., 637 Carondelet St., is reported as saying that his company intends establishing the ramie industry in the South, having, as he claims, secured a machine which successfully separates the ramie from the wood, and converts it into ribbons for commercial purposes.

—Massachusetts, East Brookfield. The Quaborg Manufacturing Company has now become an incorporated body, with a capital of $60,000. The officers are: President, T. C. Bates; treasurer, Lucian A. Taylor, both of Worcester. The above are also the directors. The company has been organized for the purpose of manufacturing woolen and cotton goods, paper and cardboard. The property owned by this company embraces the entire Sagendorph mill plant and water privilege of Lake Lashaway. The projectors have been quoted as saying that new buildings will be erected by the Quaborg Company, for its business.

—Missouri, Bowling Green. A company has been organized here under the style name of Kimbell Woolen Mfg. Co., for the purpose of manufacturing wool shoddy. S. T. Kimbell, president; E. O'Donnell, vice-president; D. H. Hamplain, secretary and treasurer; Harry Sheard, superintendent.

—*New Hampshire, Lakeport. The new yarn company who are now located in the old Bayside Mill, and which is composed of James and John W. Rutter, have commenced business under the firm name of Rutter Bros.

—New Jersey, Camden. Geo. Shimer & Son, formerly superintendent of the late firm of Shimer & Boyer, is making arrangements for the establishing of a plant at 5th and Erie Streets, for the manufacture of Germantown wool, yarns, etc.

—*New Jersey, Camden. Concerning the plant that we reported was being established at 5th and Erie Sts., by George Shimer & Son, that firm now informs us that they expect to begin operations in their plant about April 1, 1897. About 50 hands will be employed. Worsted yarns for the knitting and weaving trade will be manufactured. The plant is located in an existing building, and will be operated by steam. It will contain two worsted combs. They will sell direct.

—Oregon, Dallas. A woolen and a scouring mill is being proposed for Dallas.

—Oregon, Union. A meeting was recently held by the citizens here for the purpose of considering the matter of the establishment of a woolen mill in this city. An organization was effected by electing L. J. Davis, chairman, and C. H. Marsh, secretary. It was decided to canvass the business men, and people of Union generally, to ascertain what can be done. A committee was appointed to draft articles of incorporation. The committee is composed of A. E. Eaton, James Hutchinson, J. J. Odle, E. Draper and S. A. Pursel.

Enlargements and Improvements.

—Connecticut, Staffordville. Concerning the report that the Rawitser Bros. would place some new looms in the Home Mill, that company inform us that the new looms will not be placed immediately.

—Maine, Guilford. New machinery is being placed in the mill of the Piscataquis Woolen Company.

—New Hampshire, North Salem. W. H. Hanson, who operates a webbing weaving mill, is reported to be making preparations for increasing his capacity by putting in worsted spinning and drawing machinery.

—New York, Jamestown. The Empire Worsted Mills, at their recent annual meeting, elected J. W. Doubleday, president, E. Greenwood, vice-president, and L. M. Butman, secretary and treasurer, and it was decided to build an addition to the plant, and also a new dyehouse in the early spring, or as soon as business will warrant. The name of this concern does not appear in the directory, but as the officers are the same as those interested in the Jamestown Woolen Spinning Co., which concern also proposed to increase its plant in the near future, we believe that they are probably the same concern, and that a recent change of name has been made.

Mills Starting Up.

—California, Petaluma. The California Woolen Mills, of this city, have resumed operations. Some improvements have been made during the time that the mills have been idle.

—*Indiana, Madison. The Louisville & Madison Woolen Mill's plant here has been transferred to John D. Ross, the gentleman that we previously reported had bought the same. Preparations are now being made for starting the mills at once.

—Huntington. The Highland Woolen Mills resumed operations this week.

—Maine, Fairfield. Mr. Thomas Sampson, agent of the Vassalboro Woolen Mill, at North Vassalboro, Me., has completed arrangements for starting the new worsted mill in this place. Several thousand dollars' worth of new machinery will be purchased.

—Maine, Warren. The George's River Woolen Mills have resumed work on full time. They have been running but 32 hours a week for a long time past.

—Massachusetts, Boston. The Nonantum Worsted Company has reopened its plant at Newton, and samples are being sent out.

—*Massachusetts, East Brookfield. The broad looms are being removed from the Sagendorph Mill in order that others may be set up in their place. The mill will be operated by the Mann Brothers, as previously reported, under the firm name of Mann & Stevens. The new firm has leased the entire water privilege, and has sub-let the shoddy mill property to E. Gibson.

—Massachusetts, Hinsdale. The Hinsdale Woolen Co. has placed its samples on the market, and it is expected that the mills will soon be running.

—Massachusetts, Millville. A report reaches us that John Spencer, of Providence, R. I., and Albert Davis, of Maynard, Mass., have been at this place looking over the Maguire Woolen Mill, at Ironstone, with a view of leasing the property which has long been idle. The report also states that Messrs. Spencer and Davis represent a company who want to start up the mill and will either buy or lease.

—Massachusetts, Millbury. We learn that Newton Darling, of Worcester and Spencer, has purchased the Lapham Woolen Mill property for a corporation to be known as the Millbury Woolen Mills Company. The mill has been idle for a year, but the new company will start it up within a short time. They will manufacture a high grade of woolen goods, principally cheviots. Mr. Darling will be treasurer of the corporation.

—Massachusetts, West Millbury. E. Hoyle & Son, proprietors of the Rams' Horn Woolen Mill, are resuming operations.

—New Hampshire, Lebanon. The Riverside Woolen Company's mill, which has been closed for a time, is being started up in some departments, and the indications are that the entire plant will be running on full time at an early date.

—New Jersey, Brighton. There is a movement on foot among business men and capitalists to start up the idle mills formerly operated by the Eastlake Woolen Company. The Board of Trade is interesting itself in this movement.

—New York, Seneca Falls. The Seneca Woolen Mills, which have been closed for several weeks, have started up again, with prospects of continuing in operation for some time.

—New York, Troy. J. B. Jermain of Albany, has sold to Peter McCarthy of this city, the Beverwyck mill plant at Averill Park. This mill property was purchased by Mr. Jermain about a year ago from A. B. Knowlson at a foreclosure sale. Mr. McCarthy was said to have paid about $20,000 for the property. He will start the mills up as soon as possible.

—Ohio, Tiffin. The Tiffin Woolen Mills, which have been idle for the past summer, have resumed with a full force of hands.

—Pennsylvania, Landenberg. A large portion of the real estate of James Lund, deceased, has been sold at public auction. It consists of the worsted yarn mills, known as the Landenberg Worsted Mills, 30 houses, and about 200 acres of land.

Thomas Lund, of England, was the purchaser. $54,000 was the price paid. It is the intention of the present owner, who is a brother of the late proprietor, to put all the mills in operation at an early date.

—Rhode Island, Centreville. We are now informed that the Kent Woolen Co. is once more in control of the mill that was recently damaged by the boiler explosion, and that as soon as the repairs now in progress are completed, the mill will be started up on full time. We are also informed that the former president of the company, B. F. Waterhouse, has resigned.

—Rhode Island, East Greenwich. The plant of the Phœnix Woolen Company, known as the Livingston Mill, has been sold under a mortgage of $115,000, and was bid in by Samuel Williams, of Boston, the mortgagee, for $10,000. It is said that Mr. Williams intends to put the plant in operation at once.

—Rhode Island, Glendale. William Orrell has resumed work in his woolen mill.

—Rhode Island, Providence. The Geneva Mills, after being idle something over a year, are being started up, and a small number of persons have set to work in the picking, carding and spinning departments.

Mills Shutting Down.

—Massachusetts, Fall River. The woolen mill of the Jeese Eddy Manufacturing Company will be closed down for several weeks.

Knit.

New Mills.

—Georgia, Barnesville. The Georgia Underwear Co., with a capital of $100 000, has been organized for the purpose of establishing mills for the manufacture of knit goods. Thomas J. Simmons and J. L. Kennedy are at the head of the company.

—Georgia, Thomaston. G. W. T. Hannah is said to be contemplating the erection of a knitting mill in this place.

—New Hampshire, Hillsboro Bridge. Efforts are being made here for forming a stock company, for the purpose of erecting a new mill for manufacturing underwear. A committee recently appointed is now looking for a suitable site on which to erect a plant.

—New Jersey, Glassboro. A dispatch states that John L. Johnson, of Philadelphia, has engaged the old shoe factory, which he will convert into a knitting mill. New machinery will be installed.

—New York, Lansingburgh. John H. Meeker, formerly president of the firm of Meeker, Spotten & Meeker, whose plant at Waterford, was sold by the receiver in November last, will soon start a knitting mill in Lansingburgh.

—*New York, Little Falls. The new mill that we reported Robert Mackinnon would build in the near future will be 90 feet by 142 feet. It will probably be built this year.

—*New York, Waterloo. We reported in December that the Ryan and McDonald Building was being equipped for a woolen knitting mill. We now have the following information concerning the same: The Waterloo Knitting Company has filed papers of incorporation to make and sell knit and woolen goods. The capital stock is $25,000, divided into 250 shares at $100 a share. The directors are: John J. Bockee, Arthur B. Hopkins and Mabel L. Bockee, of Seneca Falls. They will employ about seventy hands. At first, knit underwear and combination suits will be manufactured.

—North Carolina, Grover. It is reported that D. R. Bird will build a knitting mill in this village.

—North Carolina, Kinston. Messrs. W. S. Herbert and B. Sutton are at the head of a movement for the erection of a hosiery yarn mill in Kinston.

—Ohio, Piqua. This city will furnish a new location for the Piqua Hosiery Company that was burned out in September last, and who has, since that time, been doing business in the old East India Batting Company's building.

—Pennsylvania, Phœnixville. Byrne, Parsons & Company have moved into their new plant.

—Rhode Island, Drownsville. The Providence Textile Co. is now located in the mill formerly operated by the Brookside Mfg. Co. The Textile Co. was formerly located at Providence, R. I., and is composed of T. G. Andrews, H. A. Bentley and A. J. Dobson. They manufacture shawls, robes, bicycle and golf hosiery, in which industry they employ from 30 to 35 hands. They operate eight looms and seven knitting machines.

Enlargements and Improvements.

—Georgia, Augusta. The Sutherland Cotton Mfg. Co., we understand, is now contemplating the addition of a knitting mill, and is negotiating for an established plant.

—New York, Capron. The capital stock of the Capron Knitting Company has been increased from $10,000 to $75 000, and steps are being taken looking toward an increase in the capacity of the plant. It is said to be the intention of the company to erect, in the spring, a new factory, 50x150 feet on the ground, and two stories high. 200 hands will be employed.

—New York, Greenwich. J. V. Palmer is placing five new knitting machines in his Pleasant Dale knitting mill.

—New York, Little Falls. We learn that Robert Mackinnon, the knit goods manufacturer, has just completed plans for the erection of a second large brick mill in the rear of his structure at this place.

—New York, Perry. The Perry Knitting Co. is considering the matter of increasing the capital stock from $71,000 to $100,000.

—North Carolina, Salisbury. The stockholders of the Salisbury Knitting Mills, at a meeting recently held, decided to add some new machinery to their plant in the near future. The old board of directors was re-elected, including V. Wallace, president, J. S. McCubbin, vice president, and S. H. Wiley, secretary and treasurer.

—Pennsylvania, Macungie. A report reaches us that R. F. Moyer & Son will erect an addition to their hosiery mills in the near future.

—*Pennsylvania, Reading. A dispatch states that a contract has been awarded for a large addition to the hosiery plant of Nolde & Horst, located on Moss St., between Douglass and Windsor, and that work upon the same will be begun at once. The annex will be a 3-story brick building, 165 by 33 feet, with a wing of 50 by 100 feet, in which the latest improved machinery will be placed.

—South Carolina, Charleston. The Charleston Knitting Mills will probably be doubled in capacity, in the near future.

—*South Carolina, Charleston. With the completion of the new addition that we recently reported would be made, the Charleston Knitting Mills will contain a total of 76 knitting machines. The 25 new machines that are required to bring them up to that number will be installed at an early date.

—*Vermont, Bennington. We are informed that the Lyons Brothers are now placing the knitting machinery in their mill, and that they expect to have the same in operation soon.

—Wisconsin, Milwaukee. The National Knitting Co. has filed articles of amendment for the privilege of increasing its capital stock from $100,000 to $250,000.

Mills Starting Up.

—Massachusetts, Highlandville. Carter & Company's Knitting Mill, which has been running on short time and with a reduced force of employees since last November, has started up on full schedule, and the working force will be gradually increased until the full number of hands are at work.

—New Hampshire, Laconia. The Estey Hosiery Co. is to start in about two months, and will run about 200 of the latest type of Estey automatic knitters. This company succeeds the Laconia Mfg. Co.

—New Hampshire, Laconia. The Pitman Mfg. Co. is reported to be increasing its force, and to be running a good proportion of its plant.

—New Jersey, New Brunswick. The Norfork and New Brunswick Hosiery Mills which have been closed several months resumed operations February 2nd.

—New York, Amsterdam. We have a report that William S. Van Brocklin of the firm of Van Brocklin & Stover, proprietors of the Montgomery Mills, has assumed the management of the Ben Birch Mill, which is located at Rockton, and which is now being operated by the Eagle Knitting Co., formerly the Amsterdam Knitting Co. It is expected that the machinery in this mill which has long been idle, will be running by the latter part of this month.

—New York, Amsterdam. The Charles E. Warner Company, that in May last made an assignment for the benefit of its creditors, has been succeeded by the sons of the late John Warner, who was a partner in the former company, and whose sudden death precipitated the failure. The new firm is now starting up the mill.

—New York, Cohoes. Swathling and Turner, manufacturers of knit underwear, have commenced making samples in their Excelsior Knitting Mills, after a stoppage of a year and a half.

—New York, Cohoes. Five sets of idle machinery in the Halcyon Knitting Mill will be started immediately.

—New York, Fonda. The knitting mill has been started up. It is now under the management of H. S. Hilton.

—New York, Mellenville. The Wellington Knitting Mill that we recently reported sold to William A. Harder, of Troy, New York, and J. A. Pulver, of Pulver, New York, will hereafter be operated by J. A. Pulver, in the manufacture of knitted shirts and drawers. This mill which has not been in operation for nearly two years, contains six sets of woolen cards, 1800 cotton spindles and 18 knitting machines.

—New York, Sandlake. The Kane Knitting Mill property has been turned over to the heirs of the estate of the late Nicholas T. Kane. The mills will soon be started up The levies and executions have been with drawn.

—*South Carolina, Union. The new Excelsior Knitting Mill, which was recently completed here, has commenced operations in part, and will start up in full as soon as the machinery can be got in readiness.

—Vermont, Bennington. The Bennington Knitting Mill resumed operations February 1st. The plant has been idle for several weeks.

Mills Shutting Down.

—Connecticut, Rockville. The mills of the Samuel Fitch Sons' Company, manufacturers of linings, rubber goods, knit goods, etc., are running out the stock in process, after which they will be closed down unless a purchaser is found for them in the meantime.

—New Hampshire, Lakeport. The Winthrop Knitting Mills, formerly the Halifax Mills, are partially or wholly shut down.

Silk.

New Mills.

—New Jersey, Paterson. A new silk weaving shop is now being operated by James Carroll, in the rear of 10 and 11 Ramapo Ave.

—New York, Watertown. It is said that Watertown is to have a second new silk mill, that the plans have been completed for it to come here, and that the building for its reception is already secured. The new enterprise is to come from Bayonne, N. J., and will employ 200 hands. At first the plant will be located in Knowlton Bros.' old spinning mill building, on the north side of the river, near the suspension bridge, which will serve as a shop until a new building can be erected.

—New York, Watertown. It is reported that the Duffy Brothers, silk throwsters, of Fort Plain, will establish a silk mill in Watertown.

—Pennsylvania, Alburtis. It is said to be an assured fact that Alburtis is to have a new silk mill M. Mickley has donated two acres of ground for a site, and $10,000 has been subscribed to the project by the citizens.

—Pennsylvania, Bangor. It is understood that Paterson, N. J., parties have agreed to locate a silk plant in this place, provided a suitable building is erected by the Bangor people.

—*Pennsylvania, Bangor. Concerning the silk mill that we recently reported projected for this place by Paterson, N. J., parties, the Golden Rod Silk Mfg. Co. is the company referred to. The mill contemplated will employ 400 hands. It is not yet certain that they will carry out this project, but should they do so, it is their intention to commence operations at once, in order that they may have the mill in operation by the last of July, 1897.

—Pennsylvania, Danville. The new Hartman silk mill, of which we have several times made mention during the past year, has commenced operations. It will be recalled that when the building was nearly completed the walls were leveled to the ground by a severe storm.

—Pennsylvania, Delta. It is reported that steps are being taken to establish a silk factory in Delta. A plant to cost $2000 is in contemplation.

—*Pennsylvania, Ephrata. The silk mill is almost in readiness for work to begin. Messrs. Westerhoff Bros. & Napier have already placed a number of orders for machinery for this mill. Some of the machinery is here and is being placed in position.

—*Pennsylvania, Fleetwood. The main building of the Fleetwood Silk Mill has been erected, and is about ready for the machinery. The power will be furnished by a 75 h.p. engine and an electric dynamo. The management contemplates starting at once, and when running full handed will employ 200 hands.

—*Pennsylvania, Lehighton. Messrs. Huber and Brown, of Paterson, New Jersey, are the parties who have made a proposition to locate a silk mill in this place, concerning which we recently made mention. We understand that the proposition is made conditional that the citizens here furnish a building 355 feet in length by 46 feet in width, three stories high, with engine and boiler houses attached, 24x44 feet, and 34x44 feet, respectively, in which they will give employment to some 400 hands.

Mills Starting Up.

—Connecticut, Atwoodville. James S. MacFarland's silk mill started up this week.

—Maryland, Hagerstown. Collinge & Nolan, of Paterson, N. J., have purchased the Maryland Silk Mills, in this place (of which mention has several times been made in these columns), from A. P. Conner, and the machinery in the building of Rudolph Cohen, and is putting a force of hands to work to get the machinery in shape to begin operations at once. The factory has been closed for more than a year.

Enlargements and Improvements.

—*New York, Waterford. James A. Rancy, proprietor of the Waterford Dye Works, 73 Third St., is enlarging his works, as previously reported. He is building a boiler house, 20x30, outside the main building. He started in business last July, and is now obliged to increase his facilities to meet his growing business. He is in the market for a second hand Weldon dyeing machine, also for dye tubs and vats.

Fires.

—Connecticut, Tolland. The Underwood Belting Factory occupied by the William Sumner Belt Company has been completely destroyed by fire. Loss $50,000. Insured for $20,000. The fire is supposed to have been of incendiary origin. Harry L. Adams, the yarn manufacturer of Rockville, Connecticut, who occupied rooms in the mill is said to have lost $5000 on machinery and stock.

—Massachusetts, Methuen. The mills of the Methuen Mfg. Co. were damaged by fire to the extent of about $30.0. The fire is supposed to have been set by a tramp.

—New York, Amsterdam. The shoddy mill operated by Becker, Lindsay & Nolan was burned Jan. 30. The loss was $10,000, fully covered by insurance.

—Pennsylvania, Manayunk. A fire in the Glen Rock Woolen Mills of Morris & Ott at Manayunk, caused a loss of $500, mostly on the stock.

Pennsylvania, Philadelphia. The carpet works of J. & J. Dobson, have recently been somewhat damaged by fire.

—Pennsylvania, Philadelphia. W. Erskine, manufacturer of curtains, has sustained a loss by fire of about $7600, on which there was $5000 insurance.

—Rhode Island, Natick. A thorough examination of the B. B. & R. Knight's cotton shed, at their mills in this place, shows that the amount of stock destroyed and damaged by the recent fire is greater than was at first supposed. It is now believed that the loss will be from $35,000 to $40,000, and possibly more.

Failures and Suspensions.

—Indiana, Goshen. Alfred Lowry has been appointed receiver of the Goshen Woolen Mills Company.

—Massachusetts, Millville. L. L. Whitney of this place and Boston, has filed a petition of insolvency and also asks that the firm of Whitney & Molt, who operate dye works here and of which he is a senior member, be declared insolvent. These proceedings are the outcome of a suit aggregating $55,000, which have been brought against the firm and the Whitney family by the Millbury National Bank to recover on notes discounted by the bank for Mr. Whitney.

—New Jersey, Paterson. Grimshaw Bros. have made a general assignment, both in Paterson, N. J., and Reading, Pa., for the equal benefit of their creditors. Ex sheriff James Johnson is the assignee in Paterson. It is thought that the liabilities will approximate $250,000, and assets about the same. This firm took possession of the Reading mill about ten years ago, and have been running it ever since.

—New York, Potsdam. B. T. Scott has been appointed receiver of the Potsdam Knitting Company. This step was taken by the stockholders and directors.

—Pennsylvania, Norristown. Execution has been issued against Dean & Mitchell, cotton yarn manufacturers, on a judgment confessed to Francis M. Dean, Ada F. Dean and Alexander P. Mitchell, for $13,000. Their liabilities are estimated at $45,000.

—Pennsylvania, Philadelphia. John Lee, yarn manufacturer at Emerald and Kennedy Sts., is reported to have made an assignment to James H. Lee. Six properties in the 25th ward are included in the transfer. The failure is said to have been caused by the general business depression, and losses occasioned by bad debts. The liabilities will amount to about $43,000. The mill when in operation employed 35 people. It has been idle for some little time. The creditors have held one meeting with the assignee, but nothing definite was agreed upon.

—Pennsylvania, Spring City. A report states that Sheriff Hayes, of Chester Co., has seized the property of the Schuylkill Valley Knitting Co., of this place, on an execution of $17,000. This is a new company, who recently commenced operations with 18 knitting and 25 sewing machines.

Facts and Gossip.

—Delaware, Wilmington. The Arlington Mills Manufacturing Company, who operate 15,000 spindles and 600 looms on gingham, are considering a reorganization with a view to moving their plant to Paducah.

—Georgia, Lindale. The Massachusetts Cotton Mills Company inform us that the rumor is erroneous concerning the capacity of its plant being doubled.

—Illinois, Rockford. The W. H. Price Co. has been incorporated with a capital stock of $125,000 to manufacture and sell gloves and knit goods. They will continue in operation the plant formerly operated by W. H.

Price. The incorporators are W. H. Price, A. E. Fisher and K. L. Swarthout.

—Indiana, Madison. Concerning the Louisville & Madison Woolen Mills, which we recently reported as having been sold to John B. Ross, we now learn that a new company is being formed by Mr. Ross, to be known as the Ross Textile Company. This company is formed for the purpose of operating the above mentioned mills, and others if desired.

—Indiana, Michigan City. The knitting and finishing rooms of the Amazon Hosiery Co., which removed to Muskegon, Mich., has been leased by the Lakeside Knitting Co. of this place.

—Massachusetts, Boston. A. J. Cameron & Co., woolen and worsted yarn spinners, Philadelphia and New York, have opened an office at 51 Summer St., in this city. Isaac Slocum, formerly with Chas. F. Murphy & Co., of Boston, is in charge of the new office.

—Massachusetts, Boston. A. G. Bruinier, who has formerly been connected with the New York office of Kaile & Co., took charge of the Boston branch of that firm on Jan. 1st.

—Massachusetts, Lawrence. At the annual meeting of the stockholders of the Arlington Mills company, held at the Boston office, 78 Chauncy St., on the 26th inst., it was voted to increase the capital stock $500,000, making the total capital $2,500,000. This additional capital is to provide for the cost of the new woolen mill which was begun last spring, and is now nearly completed.

—Massachusetts, Lowell. The drawing and spinning machinery in the old Dugdale Worsted Mill on Wylie St., has been shipped to the Hudson Worsted Co., Hudson, Mass., and the mill has been leased to Otis Allen & Son, for a box manufactory.

—Massachusetts, New Bedford. At an adjourned meeting of the reorganized New Bedford Cordage Company held this week, new by-laws were adopted and John W. Macomber was elected treasurer, and William T. Jenny, clerk, after which the meeting adjourned till the first Monday in March, when the unfinished business will be completed.

—Mississippi, Natches. Rosalie Cotton Mills are being advertised for sale.

—New Hampshire, Franklin Falls. The Mayo Knitting Machine & Needle Co. are increasing their machinery, and have just occupied a new addition to their shop, with more to follow. They are running four evenings per week, and employing sixty men.

—New Hampshire, Laconia. Warren D. Huse is running nearly thirty men full time, in his knitting machinery shop.

—New Hampshire, Lakeport. The Wardwell Needle Co. are running full handed and full time. The Crane Mfg. Co. are also running their machine shop full.

—New Hampshire, Lakeport. The name of the Halifax Mills is said to have been changed and will hereafter be called Winthrop Knitting Mill.

—New Jersey, Bordentown. A new carpet company has been incorporated here, which will be known as the Richard Westwood Carpet Co. Richard Westwood, of Mt. Holly, and Townsend Blake, of Philadelphia, are the incorporators.

—New Jersey, Camden. B. F. Boyer & Co. has succeeded to the business of George Shimer & Boyer, of 516 Market St., which firm was dissolved by mutual consent on January 1, 1897.

—New Jersey, Union Hill. The A. J. Mackintosh Mfg. Co. has filed a certificate of incorporation. The new company has been organized for the manufacture of down, silk and cotton goods, in the town of Union. The total amount of capital stock subscribed is $50,000, with which amount the company will commence business. The names of stockholders in the new concern are as follows: John C. Haynes, Boston, Mass.; Andrew J. McIntosh, New York; John M. McIntosh, Clifton, N. J.; Florence L. J. McIntosh, New York City, and Mattie F. Chamberlain, New York City.

—New York, Amsterdam. Becker, Lindsay & Nolan, a firm composed of C. W. Becker, William Lindsay and Edmund Nolan, who have for some time past operated the picking and carding plant in the old Carmichael Malt House, have completed arrangements for the purchase of the No. 1 mill of the late firm of Warner B. Forest & Company, which was recently sold to Francis Morris & Sons, and W. S. Van Brocklin, of Van Brocklin & Stover, for $14,000. The price paid by the last purchasers has not been made public.

—New York, Auburn. The certificate of incorporation of the Kidney & Brigden Company has been filed. The new company is composed of the following, who are also directors: George Bannigan of Auburn, Samuel H. Evins of New York, and John Mathews of Paterson, N. J., who have organized for the purpose of manufacturing, buying, dealing in, etc., of silk, retail and wholesale. The capital stock is $28,000, $500 of which will be paid in at the start.

—New York, Cohoes. The Himes Underwear Co., of this place have opened an office in New York City.

—New York, Elmira. Mention has previously been made of the efforts of the Board of Trade to secure the location of the Faatz Bros.' factory, which is at present located in Lestershire. We now have a report that the Faatz Bros. have made a proposition to move their plant here, provided that the Elmira Board of Trade will raise the sum of $10,000. The matter is now being considered by a committee appointed by the Board of Trade.

—New York, Mellenville. William A. Harder of Troy, and J. A. Pulver of Pulver's Station, have purchased the Wellington Knitting Mill, of Miller & Co., in which they expect to begin operations in April.

—New York, Troy. It is reported that two attachments have been obtained against the Wynantskill Knitting Co., knit goods manufacturers. The amounts of which aggregate $2,314, and are drawn in favor of Woodward & Stillman.

—New York, Waterford. The sale of the Hudson Valley Knitting Mill, which was to have taken place on the 22nd of this month, was postponed until March 19th.

—North Carolina, Charlotte. The Gold Crown Hosiery Mill Company that now operate the mill here, has filed articles of incorporation. The capital stock is placed at $22,500. The incorporators are G. W., C. H. and R. M. Oates, Jr.

—North Carolina, Greensboro. The Harden Cotton Mills have applied to the Legislature for a charter. The mill was established a number of years ago, but a charter has never been taken out.

—Pennsylvania, Philadelphia. I. E. Moore & Co. have succeeded to the business of the Cumberland Finishing Works Co. The new firm will make a specialty of fancy suitings and dress goods, in cotton, woolen and worsted.

—Pennsylvania, West Chester. The Brandywine Knitting Mill property has been sold under foreclosure of mortgage, by

James A. Van Voast, as referee, and was bid in by Asa Peck & Co., of Providence, R. I., for $2500.

—Rhode Island, Pawtucket. Henry A. Warburton, proprietor of the New England Thread Company, has just added $3000 worth of new improved machinery, and has enlarged the offices to about three times their former dimensions. He has also built a new store house 50x24 feet, and connected main mill with office building, two stories. He has also bought out the John P. Bray Company, bleachers and dyers of every description of cotton goods, with a specialty of aniline black dyeing, and he has made the following improvements in the dye house: one 100 h.p. horizontal, tubular steel boiler, made by the Stewart Boiler Works, of Worcester, Massachusetts; one 50 h.p. engine; new drying room; elevator; engine and boiler rooms and flooring in dyehouse, besides other small improvements, which double the former capacity of the plant.

PERSONAL RECORD.

Cotton.

Robert L. Cate is now superintendent of the cotton mill at Spray, N. C.; formerly in the Gastonia Mills, also McAdensville Mills.

James Warren, treasurer and agent of the Narragansett Mills, of Fall River, Mass., has tendered his resignation on account of poor health. He will probably visit Europe.

John Quinn, overseer of drawing and spinning, New England Bunting Co., Lowell, Mass., formerly with the Abbott Worsted Mills, Grantville, Mass.

J. Z. Kearnsey, superintendent Efird Cotton Mill, Albemarle, N. C.; for some time past, overseer of carding and spinning with the Cannon Mfg. Co.

W. A. Wheet, superintendent Cowpens (S. C.) Cotton Mills; formerly at Gaffney, S. C.

E. Shealey, superintendent Cowpens (S. C.) Cotton Mills, has resigned.

Robert Wilson, overseer of carding with the Eagle & Phenix Mills, Columbus, Ga.; formerly held a like position at Newberry, S. C.

J. A. Kilby, overseer of carding with the Harmony Mills, Cohoes, N. Y.; formerly at Fall River, Mass.

Robert Bishop, 58, died at his home in Brookline, Mass., has for many years operated a waste manufactory at South Boston.

Richard Capel, of the Lewiston (Me.) Bleachery, is dead.

James H. Kennion is now in the carding department of J. R. Montgomery's new mill, at Windsor Locks, Conn.; he was lately in New Haven, Conn.

W. P. Hurt, superintendent of the carding and spinning departments, Edna Cotton Mill, Charlotte, N. C.; formerly with the Highland Park Mfg. Co., same place.

Henry Hamel, overseer of carding in Pike's Satinet Mill, Charlton, Mass.; formerly at Janesville, Mass.

T. F. King, overseer of spinning, Sibley Mill, Augusta, Ga.

Geo. Robertson, overseer of weaving at the York Mills, Saco, Me., has accepted a position in the South.

C. M. Sloy, overseer of carding, Graniteville, S. C.; formerly with the Richland Mill, Columbia, S. C.

Herman Gross, overseer of weaving for the Dwight Mills, Chicopee, Mass.

Geo. A. Field, overseer Valley Queen Mill, Riverpoint, R. I.

Edward Cowdy, bleacher and chemist for the Stevens Mfg. Co., Fall River, Mass., has resigned, and will return to Ireland.

Frank Des Autels is now overseer of spinning in the Howland Mills, at New Bedford, Mass.

Andrew McNamara has accepted a position in the Slater Cotton Mill, at Jewett City, Conn.; was recently in Norwich, Conn.

W. J. Price, of North Grosenordale, Conn., is now in charge of weaving in the Langdon Mill, at Manchester, N. H.

Abel Broomhead, overseer of weaving for the Troy Cotton and Woolen Mfg. Co., Fall River, Mass., has resigned after a service of 28 years.

—Arthur Whitman has severed his connection with the Mile-End Thread Works, of Newark, N. J.

—T. B. Howard has accepted a position as second hand in the new mill at Selma, Ala.; he was recently at Stonewall, Miss.

—John Miller, second hand in the spinning department of the Maginnis Mills, New Orleans, La.

—W. A. Lamb, now has a position in the weaving department of the Salisbury Cotton Mills, Salisbury, N. C.; he was recently at Randleman, N. C.

—E. P. Myrick has resigned his position with the Spray Cotton Mills, and has returned to Salisbury.

—Stephen A. Aldrich has accepted an offer to go South and overseer the spinning in the Laredo (S. C.) Cotton Mills. He was recently with the Adamsdale Mfg. Company, at Adamsdale, Mass.

—W. K. Sanborn, overseer of weaving at the Maginnis Mill, New Orleans, La.

—Robert Fisher, overseer with the Mile-End Thread Works, Newark, N. J., has left the employ of that company.

—Richard Heill, superintendent of the Mile-End Cotton Thread Works, of Newark, N. J., has resigned.

—Charles Heill, for twenty years an employee of the Mile-End Cotton Thread Works, Newark, N. J., and for a long time the master mechanic of the works, has severed his connection with the company.

—Thomas T. Arnold, until recently a slasher tender at Manchaug, Mass., has moved to Jewett City, Conn.

—R. H. Mathewson, for some time overseer of carding in the Rockville Warp Mills, at Rockville, Conn., is now in charge of the spinning also.

—J. B. Williford has accepted a position as overseer of spinning in the Prattville Cotton Mill, Prattville, Ala.

—Charles H. Hobbs, agent of the Thorndike Manufacturing Co., Thorndike, Mass. has been elected president of the Palmer Savings Bank, at Palmer, Mass.

—Edward Smith is now overseer of weaving in the York Mills, Saco, Me., having has been selected to succeed Geo. Robinson, who has gone South.

—John Milner, book keeper for E. Milner & Co., at Moosup, Conn., is making arrangements for a trip South, which he will take for the benefit of his health.

—James Wood, of Pawtucket, has accepted a position as overseer of the carding department in the Warwick Cotton Mills, at Centreville, R. I.

—James Goodrow has accepted a position with the new Pepperton Cotton Mills, at Jackson, Ga., where he has charge of the cotton and spinning.

—C. B. Tilton, agent of the Dwight Mills, Alabama City, Ala., has resigned. He is now in the New England States.

—R. A. Mitchell, president of the Queen City Barn, Gadsden, Ala., has been appointed agent of the Dwight Mills, Alabama City, Ala.

—G. D. Pippens, who recently resigned his position as second hand in the card room at the Eufala (Ala.) Cotton Mill, is reported to have accepted a position with the Pepperton Mills, at Jackson, Ga.

—Augustus P. Horn, who for nine years has had charge of the weaving in the Amory and Langdon Mills, for the Amory Mfg. Co., at Manchester, N. H., was recently presented by his employees with a costly couch.

—M. A. Vining has resigned his position with the Eufaula (Ala.) Cotton Mills, where he held a position in the cloth hall, and has accepted a position with the E. & O. Railroad.

—E. F. Williams, second hand of ring spinning in the Aldrich Mfg. Company's mill, Moosup, Conn.; formerly with the Chicopee Falls (Mass.) Mfg. Co.

—Frank Knickerbocker has resigned his position as night watchman for the Grosvenordale Co., Grosvenordale, Conn.

—T. F. Hay, loom fixer, formerly with the Pacolet (S. C.) Cotton Mills, is now with the Camden (S. C.) Cotton Mills.

—J. D. Boseman, superintendent of the Albion Mills, Mt. Holly, N. C., was recently presented with a reclining office chair by his employees.

—George Taylor, superintendant of the Valley Woolen Mills, at Spencer, Mass., has resigned in order to accept position of superintendent for Newton Darling, at Millbury, Mass.

—Thomas Bolton is now overseer of weaving at the Edna Mills, Reidsville, N. C.

—S. W. Oliver has resigned his position as overseer of weaving with the Mountain Island (N. C.) Manufacturing Co.

—F. C. Sawyer, who has had charge of carding for Comins & Co., at Rochdale, Mass., for thirteen years, has resigned.

—A. F. Knight, who recently resigned his position as superintendent of the Berkshire Mills, at Adams, Mass., has accepted a position in the state of Rhode Island.

—J. R. Killian, of Columbia, S. C., has accepted a position as overseer of carding with the Newberry (S. C.) Cotton Mill. At one time he had charge of carding in a Columbia (S. C.) Mill.

—S. W. Oliver has resigned his position with the Mountain Island (N. C.) Mfg. Co., where he had charge of the weaving.

—John Nuttall has resigned his position with the Newberry (S. C.) Cotton Mill, where he has had charge of the weaving during the past nine months, and has accepted his old position as overseer of weaving with the Maginnis Cotton Mills, New Orleans, La.

—J. A. McCall is now in charge of the Cloth Hall in the Exposition Cotton Mills, Atlanta, Ga.

—W. D. Walker has resigned his position as overseer of spinning in the Exposition Mills, Atlanta, Ga.

—Jas. Jeter is now in charge of the spinning in Mill No. 2 of the Exposition Cotton Mills.

—James Hughes has been appointed overseer of spinning with the Exposition Mills, Atlanta, Ga.

—W. I. Walker, formerly overseer of spinning with the Exposition Mills, Atlanta, Ga., is now in charge of the spinning in the Maginnis Cotton Mills, at New Orleans, La.

—W. Henry Howell is now overseer of carding in the Massachusetts Mills, Lindale, Ga. He at one time held the position of superintendent of the Athens (Ga.) Cotton Mill.

—W. G. Paul has resigned from the Massachusetts Mills at Linsdale,, Ga. where he held the position of overseer of carding, and has gone to Augusta, Ga.

—E. B. Anderson, master mechanic Lanett Mills, West Point, Ga., has resigned.

—Allen Little is now superintendent of the Blue Springs Cotton Mills, at Oxford, Ala. He was recently at Griffin, Ga.

—Travis Bryant of Griffith, Ga., is to be the engineer of the Blue Springs Cotton Mill, Oxford, Ala.

—Isaac K. Stead is now in charge of the carding for the Falls City Jeans & Woolen Co., Louisville, Ky. Previous to accepting this position, he held a similar one with W. J. Dickey & Sons, Oella, Md.

—Thomas Riley has resigned his position with the Grosvenordale Company, at North Grosvenordale, Mass., and moved to Woonsocket, where he has accepted a position as overseer of weaving.

—Amos Harvey has accepted a position as second hand in the carding department at the Williamsville Mills, Williamsville, Mass.

—Chas. E. Wade has resigned his position of overseer of spinning in the Ray Cotton Company's Mill, and has accepted a similar position in the Ballou Mill, at Ballouville, Conn.

—William H. Norton, formerly at Biddeford, Maine, has accepted an overseer's position with the Turners Falls (Mass.) Cotton Mills.

—Frank Des Autels is now in charge of the spinning department of the Howland Mills, New Bedford, Mass.; has recently been in charge of spinning in the No. 1 Berkshire Mills, Adams, Mass.

—A. E. Pray, of Danielson, Conn., is in charge of the spinning in the Atteawaugan Mill, Killingly, Conn.

—A. A. Handy, overseer of spinning for the Attawaugan Co., Killingly, Conn., has resigned.

Woolen.

Albert Bradbury, for several years paymaster of the Dexter (Me.) Woolen Mills, has resigned.

H. Hargraves, overseer of dyeing with Milner & Co., Moosup, Conn.; formerly at Central Falls, R. I.

John Lomas, confidential bookkeeper for the Capron Woolen Co., at Uxbridge, Mass., for the past 18 years, has resigned.

J. E. C. Laffar, overseer of finishing, Hudson River Woolen Mill, Newburg, N. Y.; formerly of St. Joseph, Mo.

Thomas McEwen, overseer of finishing, at Sawyer's Woolen Mills, Dover, N. H.; recently with the Phenix Woolen Co., in the Livingston Mills, East Greenwich, R. I.

Patrick McDonough, overseer of the fulling department, Sawyer Woolen Co., Dover, N. H., is dead. He had been with the Sawyer Company during the past 36 years.

Jerry Provo, overseer of spinning, Geneva Worsted Mills, Providence, R. I.; formerly with the Capron Woolen Co., at Uxbridge, Mass.

James Sampson, with the Belleville Mfg. Co., Wicksford, R. I.

Fred Voll, dressing department in L. L. Allen & Bros. Woolen Mills, at Rochester, N. Y.; formerly at Utica, N. Y.

John Webendorfer, overseer of weaving at the Waverly Mill, Pittsfield, Me.

Chas. H. England, overseer of weaving, with the Great Falls Woolen Co., Somersworth, N. H.; recently at Rochdale, Mass.

Edward Derocha, of the Belleville Mfg. Co., Wickford, R. I., owing to poor health has resigned.

W. J. Curtis, dressing department, in Chas. A. Stevens & Co.'s mill, Ware, Mass.

—Robert Flemming, of Sherbrook, P. Q., has accepted a position with the Nonantum Worsted Company, Newton Upper Falls, Mass., where he will have charge of the dyeing.

—Mr. Isbel has resigned the position of overseer of dyeing with the Concord Manufacturing Co., at Penacook, N. H., and has accepted a like position at Lowell, Mass.

Arthur Greaves, superintendent Thos. Kay Woolen Mill Co., Salem, Oregon; formerly overseer of worsted spinning at Moosup, Conn.

John R. Cowan, overseer of finishing for the Sawyer Woolen Co., of Dover, N. H., for the past ten years, has resigned.

—J. F. Shehan, section hand in the weaving department of the Mascoma Flannel Company, Lebanon, N. H.

—Sidney B. Hayes, paymaster at the Cocheco Mills, East Rochester, N. H., has been elected a member of the city council.

—Willis N. Anthony, overseer of weaving, with Dews Woolen Co., North Dexter, Maine, was recently presented with a gold ring by his employees.

—J. H. London, superintendent Excelsior Woolen Mills, Wales, Mass., was recently presented by his employees with a diamond ring.

—E. M. Sinclair, agent of the Cocheco Woolen Mfg. Co., East Rochester, N. H., has been elected a member of the school board of that city.

—E. G. Worcester has been appointed book-keeper for the Crosby Mfg. Co., at East Glastonbury, Conn. His father, G. E. Worcester, has been overseer of dyeing for this company for a number of years.

—Charles Trask has resigned his position in the card room at Brighton, R. I., and has accepted a position at Montmorency, P. Q.

—Edward Conrick is now with the Rock Mill Company, Rockville, Conn.

William C. Damon, superintendent of M. Y. Stevens & Sons, North Andover (Mass.) Mill; formerly assistant superintendent of their Marland Mill, at Andover, Mass.

James Monahan, now with the Lowell (Mass.) Mfg. Co.; formerly in charge of the drawing, spinning and twisting in Rawitser Bros. Mill, Meriden, Conn.

Henry Kershaw, superintendent for the Passaic Woolen Co., Passaic, N. J.

Moses G. Stevens, Jr., assistant superintendent of Stevens' Mill, at Andover, Mass., has been promoted to a position in the office, where he will aid in the direct management of the company.

—Charles Davis has accepted a position with the Warren Woolen Company, of Stafford Springs, Conn.

—J. Mahery, overseer of carding, in the Falls City Woolen Mill, Louisville, Ky., has resigned his position in order to accept the position of superintendent of the Atlanta Woolen Mills, Atlanta, Ga.

—J. E. Shartel has accepted the position as superintendent of S. Meyers & Sons Mill, at Tiffiny, Ohio. Mr. Shartel was recently at Laporte, Ind.

—James S. Manock, for some time past, overseer of the Ipswich (Mass.) Mills, has accepted a like position with the Walker Mills, East Wilton, Me.

—John W. Rutter, overseer of spinning in the Walker Mills, at East Wilton, Me., has resigned his position and will, in company with his brother James, embark in the manufacturing of woolen yarns, at Lacona, N. H.

—A. W. Winans, formerly with Akers & Taylor, at Charlton, Mass., is now in charge of the spinning in the Hamilton Woolen Mills, Southbridge, Mass.

—Thomas Crofenell, formerly with the Kent Woolen Co., at Centreville, R. I., has gone to Maine.

—Boothroyd Wimpenney is now manager of the Colonial Woolen Co., Trenton, N. J.; was recently at Bristol, Pa.

—Sidney Gray, of Brighton, Me., is now in charge of the gigging department in the Robinson Mills, South Camden, Me.

—Israal Best, formerly with the Arlington Mills at Lawrence, Mass., now has charge of the combing department in the Bradford Mills, at Germantown, Philadelphia.

—William H. Wright, overseer of combing in the Bradford Mills, Germantown, Philadelphia, has resigned his position.

—Sidney Gray, of Brighton, Me., is now in charge of the gigging department in the Robinson Mills, South Windham, Me.

—W. M. Eastwood once more holds his position as overseer of dyeing in the

Highland Mills, at Huntington, Mass., having recently returned from Hillsboro Bridge, N. H., in order to accept his present position.

—Theodore G. Beckert, designer, has accepted a position with the Waverly Woolen Mills, at Pittsfield, Maine.

—Joseph Carter is overseer of finishing in Magner's Mill, at Pascoag, R. I.

Knit.

Josiah Butler, treasurer of the Shaw Stocking Co., Lowell, Mass., died Jan. 21, at the age of sixty years.

F. M. Calley, overseer of finishing, with A. H. & C. B. Alling, Derby, Conn.

John Kenney, overseer of spinning in the Dudley Hosiery Mills, Newton Lower Falls, Mass., has resigned.

—Robert E. Storer has been appointed superintendent of the Eureka Knitting Mill, at Cohoes, N. Y.

—C. M. Davenporf has been appointed a director and secretary of the Mohawk (N. Y.) Knitting Mills.

—J. B. Rafter has been elected president and treasurer of the Mohawk Knitting Mills, Mowhawk, N. Y.

—James McCormick has accepted a position as boss knitter for H. S. Hilton, Fonda, N. Y.

—W. J. Cheer is now in charge of the spinning department with the Plainville (Conn.) Mfg. Co.; formerly at Hagaman's Mills, New York.

—J. F. O'Mella is overseer of spinning for H. S. Hilton, at Fonda, N. Y.

—R. W. Duxbury has been engaged to take charge of the carding in the Fonda (N. Y.) Knitting Mills.

Silk.

—W. H. Hall has resigned his position with the Cheney Silk Mills, at South Manchester, Conn., after a service, as plumber, of twenty-eight years.

Miscellaneous.

—John C. Setchell has resigned his position as draughtsman with the Knowles Loom Works, Worcester, Mass.

—William M. Leonard, founder of the Halifax Mills, Lakeport, N. H., and formerly paymaster there, is now bookkeeper with the Crane Mfg. Co., of Lakeport.

—Daniel Gee has severed his connection with the Boston Finishing Works, at Williamstown, Mass., where he held the position of superintendent, and has accepted a position with McKenzie & Ward, at Cariton Hill, N. J., where he will have charge of the dyeing department.

Marriages.

—J. Thomas Alsobrooks, the new second hand of carding in the Eufala Cotton Mill, has recently been united in marriage to Miss Minnie Price, of Eufaula.

—Charles Barefield and Miss Lena Hatfield, of Eufaula.

—Rockville, Conn.: Mr. George E. Perkins, with Belding Bros., and Miss Jessie May Goldrick.

—Fall River, Mass.: Mr. Henry Borden, book-keeper at the Slade Mills, and Miss Annie Westwell, of Pawtucket, R. I.

—Jacob F. Rowland and Miss May Humphrey. Mr. Rowland holds a position as overseer of finishing in a mill at St. Jonesville, N. Y.

—Mr. Geo. O'Brien, treasurer of the Cotton Spinner's Union, and Miss Carrie I. Grant. A reception was tendered to the members of the Union, and some two hundred attended.

—Mr. Charles Bottomley, designer with A. Priestley & Co. Worsted Mills, at Camden, N. J., and Miss Lucy Pickering, a Camden school teacher.

—E. P. Lansing, formerly superintendent of the Lansing Knitting Mills, of Cohoes, N. Y., and Mrs. G. O. Kellum.

Deaths.

—A. B. Fiedler, 68, formerly a manufacturer of dress goods, at Chicago, Ill.

—Frederick H. Bent, 23, of hemorrage. Deceased was a son of W. H. Bent, of the Mason Machine Works, Taunton, Mass., witn which concern he was also engaged.

—Joseph Brooks, 67, formerly overseer of finishing at the Glendale Mills, Glendale, R. I.

—Richard Clark, 75, at his residence, 4635 Lesher Street, Frankford, Penn.; was a retired manufacturer of cotton goods.

—Adam Meyers, aged 90, at Philadelphia, Penn.; deceased was for fifty years superintendent of Weaver & Fitler's rope works.

—Forest G. Coburn, aged 47, an enployee in the Merrimac Mills, at Lowell, Mass.

—Mr. James W. Simmonds, engineer for the last ten years for the Providence Dyeing, Bleaching and Calendering Co., at Olneyville, R. I.

—E. S. Kirker, Freetown, Mass.

—Harlan P. Hosley, an overseer in the Naumkeag Steam Cotton Mills, at Salem, Mass. Deceased was formerly with the Dwight Mills, Chicopee, Mass.

—Henry Basey, formerly master-mechanic at the Mechanics Mills, Fall River, Mass.

—Colonel Geo. P. Swift, 82, president of the Muscogee Mfg. Co., Columbus, Ga.

—Mr. Thomas Edmunds, 60, treasurer of the Cocheco Mills, at Dover, N. H. Deceased resided at Newton, Mass.

—Lyman Nuttall, 25, superintendent Halcony Knitting Mills, Cohoes, N. Y.; was the son of Wm. Nuttall, proprietor of the Halcony Knitting Mills.

—Gen. S. D. Weakley, of Florence, Ala.; deceased was at one time engaged in the manufacture of cotton yarns.

—Justis A. Carrile, 56, at his home in Manheim, Penn. At the time of his death he was secretary and treasurer of the Gloucester Manufacturing Co., with which company he has been connected for twelve years. He was also an officer in the Anconda Print Co.

—Isaac R. Scott, 80, for fifteen years past, superintendent of the Skenando Cotton Company's Mills at Utica, N. Y., immediately previous to which time he held a position with the Boston Manufacturing Co., at Waltham, Mass., which position he accepted after resigning the master mechanics position with the Elliot Mills, a concern then existing at Newton Upper Falls, Mass.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Patterson, N. J.

Automatic Boiler Feeds.
D'Este & Seeley Co, 29 Haverhill St, Boston

Balling Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark N. J.

Bandings.
See under Yarns.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Danforth Belting Co, 221 Chestnut St, Phila, Pa.
Fell, Geo. & Son Bolton, England.
Munson, Chas, Belting Co, Phila, Pa.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Danforth Belting Co, 221 Chestnut St, Philadelphia, Pa.

Bindings.
See Tapes and Braids.

Bleaching Materials.
Roessler & Hasslacher Chemical Co, 73 Pine St, New York.

Bobbin Covers.
Hegeman, John, Amsterdam, N. Y.

Bobbins, Spools, Shuttles, Etc.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
Woonsocket Shuttle Co, Woonsocket, R. I.

Boiler Compounds.
Imperial Chemical Co, 432 Market St, Phila, Pa.
Lord, G. W, 316 Union St, Phila, Pa.

Boxes, Paper.
Palmer, J. S, 35 Wistar St, Germantown, Pa.

Boxes, Wooden.
Pearson, J. T, Kensington, Pa.

Braids.
See Tapes and Braids.

Braiding Machines.
Thun & Janssen, Reading, Pa.

Burr Pickers.
Atlas Mfg. Co., Newark, N. J.
Sargent's, C. G. Sons, Graniteville, Mass.

Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Card Feeds.
Atlas Mfg. Co, Newark, N. J
Kitson Machine Co, Lowell, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Calico Printers' Machinery and Supplies.
New Bedford Copper Co, New Bedford, Mass.
See also Dyeing, Bleaching Machinery, etc.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester, Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Crompton Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Chemicals.
De Ronde, A, & Co, 254 Front St, New York.
Roessler & Hasslacher Chemical Co, 73 Pine St, New York.

Chemist.
Huntington, Dr. H, 159 Front St, New York.

Coal.
Dominion Coal Co, Ltd, 95 Milk St, Boston

Copper Print Rollers.
New Bedford Copper Co, New Bedford, Mass.

Copper Work for Dyers.
Brabender, Chas, Sr, Paterson, N. J.
Oat, Jos. & Sons, 232 Quarry St, Phila, Pa.

Cotton.
Blaisdell, S, Jr, Co, Chicopee, Mass.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Ashworth, Elijah, Fall River, Mass.
Atherton Machine Co, Lowell, Mass.
Crompton Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester Mass.
Draper Company, Hopedale, Mass.
Easton & Burnham, Pawtucket, R. I.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co, Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.
Mason Machine Works, Taunton, Mass.
Providence Machine Co, Providence, R. I.
Saco Water Power Machine Shop, Biddeford, Me
Stoddard, Haserick, Richards & Co, Boston, Mass.
Thun & Janssen, Reading, Pa.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket R, I.

Cotton Openers and Lappers.
Atherton Machine Co, Lowell, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kitson Machine Co, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.

Cotton Webbing.
Witter, H. M, & Co, Worcester, Mass.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Damper Regulators.

D'Este & Seeley Co. (Curtis), 29 Haverhill St, Boston, Mass.

Designers.

Fresnel, Gustave, 125 W. 56th St, N. Y.
Hand, F, & Co, Paterson, N. J.

Dryers.

Philadelphia Textile Machinery Co, Philadelphia, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.

See Wool and Waste Dusters.

Dyeing, Bleaching and Finishing.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Kensington Dye Works, Kensington, Pa.
Warren, W, Thread Works, Westfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.

Birch Bros., Somerville, Mass.
Butterworth, H. W, & Sons Co, Phila, Pa.
Delahunty Dyeing Machine Co, 152 N. Front St, Phila. Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln & Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co, Springfield, Vt.
Phenix Iron Foundry, Providence, R. I.
Rockwell, W. S. & Co, 26 Cortlandt St, N. Y.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.

Dye Sticks.

Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

Dyestuffs and Chemicals.

Anchor Color Mfg. Co, 464 Cherry St, New York.
Arnold, Peck & Co, Providence, R. I.
Ashley, T. C, & Co, 145 Milk St, Boston.
Atteaux, F. E, & Co, 172 Purchase St, Boston, Mass.
Beach & Co, Hartford, Ct.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Corey, S. J, 273 Congress St. Boston
De Ronde, A, & Co, 254 Front St, New York.
Farbenfabriken of Elberfeld Co, 77 William St, N. Y.
Geisenheimer & Co, 180 Front St, New York.
Hanna, W. W, 52 N. Front St, Phila, Pa.
Harway Dyewood & Extract Mfg. Co, 184 Front St, N. Y.
Jaeck Bros, J, 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Kalbfleisch, Franklin H, Co, New York.
Kalle & Co., 77 John St., N. Y.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 79 Murray St., N. Y.
Matheson, W. J. & Co, 178 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
Nashoba Co, Ayer, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Phillips, Moro Chemical Co, 131 S. 3d St, Phila., Pa.
Polhemus, Henry, 66 Maiden Lane, N. Y.
Roessler & Hasslacher Chemical Co, 73 Pine St, New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 157 Maiden Lane, N. Y.
Sykes & Street, 85 Water St, N. Y.

Dyers and Finishers.

Bay State Dyeing & Finishing Co, North Andover Depot, Mass.
Boston Finishing Works, Williamstown Mass.
Cranston Worsted Mills (yarns), Bristol R. I.
Firth & Foster Co, Kensington, Pa.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Kensington Dye Works, Kensington, Pa.
Oakdale Dye Works, 913 W. York St, Phila, Pa.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Warren, W, Thread Works, Westfield, Mass.

Dyers' Clogs.

Wildman, Jos, & Co, 1908 N. Front St, Phila

Electrotyping and Printing.

J. J. Ryder & Co, 210 Westminster St, Providence, R. I.

Elevators.

Cohoes Foundry & Machine Co, Cohoes, N.Y.
Graves Elevator Co, Rochester, N. Y.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Salem Foundry & Machine Shop, Salem, Mass.

Engineers, Electrical.

Smeallie Bros, Amsterdam, N. Y.

Engineers, Mechanical.

Berlin Iron Bridge Co, E. Berlin, Ct.
Ferguson, John W, Paterson, N. J.
Smeallie Bros, Amsterdam, N. Y.

Engraving on Wood.

Ryder Co, J. J, 210 Westminster St, Providence, R. I.

Express Money Orders and Travelers' Cheques.

American Express Co, offices in every city

Factory Sites.

Dolge, Alfred, Dolgeville, N. Y.
Illinois Central R. R, 506 Central Station Chicago, Ill.

Feed Water Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.
Smeallie Bros, Amsterdam, N. Y.

Finishing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Fluted Rolls.

Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River. Mass.

Fuel Oil Furnaces.

Rockwell, W. S, & Co, 27 Cortland St, N. Y.

Fulling Mills for Knit Goods.

Scott, H. W, Bennington, Vt.

Fulling Mills for Woolen Goods.

Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Singeing Machines.

Curtis & Marble Machine Co, Worcester, Ms.
Rockwell, W. S. & Co, 26 Cortlandt St, N. Y.

Gear Cutting Machine.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E, Co, New London, Conn.

Heating.

See Ventilating.

Heddles.

Watson, L. S, Mfg. Co, Leicester, Mass.

Hosiery Boards.

Pearson, J. T, Kensington, Pa.

Index.

Burr Index Co, 336 Asylum St, Hartford, Conn.

Insurance (Employers' Liability).

Employers' Liability Assurance Co, 28 Central St, Boston, Mass.

Knit Goods Edgings, Trimmings, etc.

Byram, F. A, Germantown, Pa.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Friedberger, C, Edgings, Germantown, Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.

Knit Goods Finishing Machines, Crochet, Etc.

Champion Sewing Machine Co, 1819 N. 5th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.

Knitting Machine Cylinders.

Ashman, Stephen A, 3 Fetter Lane, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford, W, & Co, Little Falls, N. Y.
Stanton & Lewis, 318 Branch St, Phila, Pa.

Knitting Machinery.

Ardrey, S. B, & Sons, Bristol, Pa.
Boss Knitting Machine Co, 7th and Walnut Sts, Reading, Pa.
Brinton, H, & Co, 213 Race St, Phila; Pa.
Campbell & Clute, Cohoes, N. Y.
Champion Sewing Machine Co, N. W., cor. American and Diamond Sts, Phila, Pa.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Co, South Bethlehem, Pa.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Hodgson & Hoit, Laconia, N. H.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos (Cutters, etc.), Cohoes, N. Y.
Leighton Machine Co, Manchester, N. H.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
National Automatic Knitter Co, Cherry St, Philadelphia, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Payne, G. W. & Co, Pawtucket, R. I. (Winders.)
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stafford, W, & Co, Little Falls, N. Y.
Standard Machine Co., 508 Minor St., Philadelphia, Pa.
Taylor, James, 835 Arch St. Phila, Pa.
Union Raveller Co, Troy, N. Y.

Knitting Needles.

Breedon, Wm, & Son, Amsterdam, N. Y.
Corey, Wm, Co, Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Lydall, H, & Foulds, Manchester, Conn.
Page Needle Co, Chicopee Falls, Mass.
Star Needle Co, New Britain, Conn.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.

Bullock & Crenshaw, 528 Arch St Phila, Pa.

Looms.

Crompton Loom Works, Worcester, Mass.
Draper Company, Honedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Riehl, Henry & Son, 1130 Charlotte St, Philadelphia, Pa. (For narrow fabrics.)
Whitin Machine Works, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Picker Manufacturers

Crompton Loom Works, Worcester, Mass.
Loom Picker Co, Biddeford, Me.
Novelty Loom Picker Works, 3-7 So. 48th St, Philadelphia, Pa.

Lubricators.

Dixon, Jos, Crucible Co, Jersey City, N. J.

Lumber.

Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.

Gerry, George, & Son, Athol, Mass.

Machinery Dealers.

Schofield, Geo. L, 123 N. Front St, Phila,
Scott, James, 123 No. Front St, Phila, Pa.

Machinery Wipers.

American Silk Mfg. Co, 311 Walnut St, Philadelphia, Pa.

Machinists' Tools.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Mails.

Walder, J, Paterson, N. J.

Manufacturing Chemists.

Kalbfleisch, Franklin H, Co, New York.

Measuring and Folding Machines.

Curtis & Marble Machine Co, Worcester, Ms
Elliott & Hall, 514 Harmon St, Worcester, Mass.

Mill Builders and Engineers.

Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Mill Supplies.

American Supply Co, Providence, R. I.
Ashoff, Charles, 191 Becks St, Phila, Pa.
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Hill, Jas, Mfg. Co, Providence, R. I.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg. Co, Leicester, Mass.

Napping Machines.

American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Parks & Woolson Machine Co, Springfield, Vt.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Oilless Bearings.

N. American Metalline Co, 62 W. Ave. and 3rd St, Long Island City, N. Y.

Paints.

American Fire Resisting Paint Co, 17 Broadway, New York.
Devoe & Reynolds, Fulton and Williams St, New York.

Pantagraphs for Mill Engraving.

Johnson, C. A, 22 Dey St, New York

Paper Cop Tubes.

Taylor, Chas. F, 48 Custom House St, Providence, R. I.

Patent Solicitors.

Crosby & Gregory, 34 School St, Boston, Mass.
Upham, A. B, 713 Tremont Bldg, Boston, Mass.
Wright, Brown & Quimby, 53 State St, Boston, Mass.

Penstocks.

Dalrymple, George, Fair Haven, Vt.

Peroxide of Sodium.

Roessler & Hasslacher Chemical Co., 73 Pine St, New York.

Picker Sticks.

Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.

Garfield Woolen Co, Garfield, N. J.

Pipe Covering (Magnesia).
Keasby, R. A, 54 Warren St, New York.
Keasby & Mattison Co. Ambler, Pa.
Nightingale, S. C, & Childs, Atlantic Ave, Boston, Mass.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Cresson, Geo. V, Co, Philadelphia, Pa.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kilburn, Lincoln & Co, Fall River, Mass.
Smeallie Bros, Amsterdam, N. Y.

Presses.
Crawford J. J, & Son, Nashua, N. H.
Curtis & Marble Machine Co, Worcester, Ms.
Hodgson & Holt, Laconia, N. H.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Taylor, James, 835 Arch St, Phila, Pa.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressure Regulators for Steam and Water.
D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Kalbfleisch, Franklin H, Co, New York.
Smeallie Bros, Amsterdam, N. Y.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Gowdey, J. A, & Co, Providence, R. I.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.
Friedberger, C, Germantown, Pa.

Roller Skins.
Fell, Geo, & Son, Bolton, England.

Roofing, Gravel, Slag and Composition.
Armitage Mfg. Co, Richmond, Va.
Warren Chemical & Mfg. Co, 45 Fulton St, New York.

Roofing, Paint and Paper.
Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.
Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Saddles, Stirrups and Levers.
Dixon Lubricating Saddle Co, Bristol, R. I.

Schools.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Sewing Machines and Supplies.
Birch Bros., Somerville, Mass.
Champion Sewing Machine Co, N. W., cor. American and Diamond Sts, Phila, Pa.
Dinsmore Mfg. Co, Salem, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Mills, Wm, 120 No. 7th St, Philadelphia, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Crompton Loom Works, Worcester, Mass.

Singe Plates.
New Bedford Copper Co, New Bedford, Ms.

Sizing.
American Glutrose Co. Penn Mutual Bldg, Phila, Pa.

Skylights (Metal).
Van Noorden & Co, Boston, Mass.

Soaps.
American Soap & Washolene Co, Cohoes, N. Y.
Holbrook Mfg. Co., 466 Washington St., N. Y.
India Alkali Works, Boston.

Spindles.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Easton & Burnham, Pawtucket, R. I.
Providence Machine Co, Providence, R.I.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spinning Cylinders.
Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Rings.
Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinners' Supplies.
Dixon Lubricating Saddle Co, Bristol, R. I.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.
Providence Machine Co, Providence, R. I.

Steam Boilers.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.

Steam Damper Regulators.
D'Este & Seeley Co, 29 Haverill St, Boston Mass.

Steam Engines.
Brown, C. H, & Co, Fitchburg, Mass.
Newburgh Ice Machine & Engine Co, Newburgh, N. Y.
Toomey, Frank, 131 N. 3d St, Phila, Pa.

Steam Separators.
D'Este & Seeley Co. (Curtis), 29 Haverill St., Boston.

Steam Specialties.
D'Este & Seeley Co, 29 Haverhill St, Boston.
Simmons, John & Co, 103-110 Centre St, N. Y.

Steam Traps.
D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass. (return float and expansion).

Steel Castings.
Chester Steel Castings Co, 407 Liberty St, Phila, Pa.

Stop Motion for Looms.
Tucker Stop Motion Co., Hartford, Conn.

Tanks, Tubs and Vats.
Brabender, Chas, Sr, Paterson, N. J.
Corcoran, A. J, 11 John St, N. Y.
Cypress Lumber Co, Apalachicola, Fla.
Cypress Tank Co, Bridgeport, Florida.
Hall, Amos H, No. 2nd above Cambria, Phila, Pa.
Oat, Jos, & Sons, 232 Quarry St, Phila, Pa.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes and Braids.

Fleming & Chapin, 215 Church St, Phila, Pa.
Kenyon, John J, Pawtucket, R. I.
Perseverance Mills, 2632-40 Mascher St Phila, Pa.
Witter, H. M. & Co, Worcester, Mass.

Teasels.

Kellogg, Thos. C, Skaneateles, N. Y.
Kellogg, Wm, W, Skaneateles, N. Y.
McLaughlin Bros, Skaneateles Falls, N. Y.

Temperature Regulators.

D'Este & Seeley Co, 29 Haverhill St, Boston.

Tentering Machines.

See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.

N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.

Howard, Geo. C., 1783 Barker St., Phila., Pa

Traveler's Cheques.

American Express Company.

Turbines.

Burnham Bros, York, Pa.
Christiana Machine Co, Christiana, Pa.
James Leffel & Co, Springfield, Ohio

Valves.

D'Este & Seeley Co, 29 Haverhill St, Boston, Mass.

Ventilating Apparatus.

Berry, A. Hun, 23 W. 1st St, Boston, Mass.
New England Heating & Ventilating Co, Providence, R. I.
Pancoast Ventilator Co, Phila, Pa.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.
Van Noorden & Co, Harrison Ave, Boston, Mass.

Washers (Cloth).

Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.

Watchman's Clock.

Eco Magneto Co, 620 Atlantic Ave, Boston.
Nanz & Co, 116 Chambers St, New York.

Water Pressure Regulators.

D'Este & Seeley Co, 29 Haverhill St, Boston.

Water Wheels.

Burnham Bros, York, Pa.
Christiana Machine Co, Christiana, Pa.
Humphrey Machine Co, Keene, N. H.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.

Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.
Replogle Governor Works, Akron, Ohio.

Winders. (Hosiery.)

Payne, G. W. & Co, Pawtucket, R. I.
Universal Winding Co, 226 Devonshire St, Boston.

Wool.

Lyon, John H, & Co, 12 Reade St, N. Y.
Webb, Chas. J. & Co, 156 N. Front St. Phila, Pa.

Wool Cleaning Compound.

India Alkali Works, Boston.

Wool Cleaning Process.

International Safety Solvent Co., Providence, R. I.

Wool Combing Machinery.

Crompton Loom Works, Worcester, Mass.

Wool Extracts.

Daly, Jas. E., & Co., 105 River St., Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Muhlhauser, F, Co, Cleveland, Ohio.
Sullivan, R. T, 155 Federal St, Boston, Mass.

Wool and Waste Dusters.

Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen Machinery.

Altemus, W. W, & Co, 2816 N. 4th St, Phila Pa.
Atlas Mfg. Co., Newark, N. J.
Crompton Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kitson Machine Co, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.
Payne, G. W. & Co, Pawtucket, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Thun & Janssen, Reading, Pa.
White, John F, 38 River St, Providence, R. I.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Wool, Hair and Noils.

Fowles & Co, 102 Church St, Phila.
Lyon, John H, & Co, 12 Reade St, N. Y.
Muhlhauser, F, Co, Cleveland, Ohio.
Webb, Chas. J, & Co, 156 N. Front St, Phila Pa.

Wool Shoddies.

Collings, Taylor & Co, Cleveland, Ohio.
Garfield Woolen Co, Garfield, N. J.
Muhlhauser, F, Co, Cleveland, Ohio.
Riverdale Woolen Co, Riverdale, Northbridge, Mass.

Wool Sorters and Scourers.

Duross, Theodore A, Kensington Ave. and Huntingdon St, Phila.

Wool Washing, Preparing and Drying Machinery.

Kitson Machine Co, Lowell, Mass.
Sargent's, C. G, Sons, Graniteville, Mass.

Wool Waste.

Hollister Bros, 160 5th Ave, New York.

Yarns, Threads, Etc.

Banding.

Kenyon, John J, Pawtucket, R. I.
Moore, C. & Co. 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass
Whittier Cotton Mills, Lowell, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
White, James F, & Co, N. Y. and Phila, Pa.
Whittier Cotton Mills, Lowell, Mass.

Carpet Yarns.

Fleming & Chapin, 215 Church St, Phila, Pa.

Colored Cotton Yarns.

Eichman & Sternberg, 488 Broadway, N. Y.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Tucker & Cook Mfg. Co, Conway, Mass.
Wilmington Mills Mfg. Co, Wilmington, Del.

Cotton Warps and Yarns.

Abegg & Rusch, 92 Grand St, N. Y.
Clark, Wm. Co, Westerly, R. I.
Cohannet Mills, Taunton, Mass.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa

Germantown Spinning Co, Germantown Pa.
Globe Yarn Mills, Fall River, Mass.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York City.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Monument Mills, Housatonic, Mass.
North Athens Cotton Mills, Athens, Tenn.
Orswell Mills, Fitchburg, Mass
Sampson, O. H, & Co, 67 Chauncy St, Boston, Mass.
Montgomery, J. R, Co, Windsor Locks, Ct.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co., 86-88 Franklin St.
Skerry, A. T, 47 Leonard St, New York.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.

Glazed Yarns.

Blodgett & Orswell, Pawtucket, R. I.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Kenyon, John J, Pawtucket, R. I.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex, & Co, 54 Leonard St, New York.
Malcolm Mills Co, Frankford, Pa.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Hadley Co, 95 Milk St, Boston, Mass.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex, & Co, 54 Leonard St, New York.
Moore, C, & Co, 12 S. 5th St, Pilha, Pa.
Warren, W, Thread Works, Lowell, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm. Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Cohannet Mills, Taunton, Mass.
Croll, Albert Ivins, Boston, Mass.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Germantown Spinning Co, Germantown, Pa.
Globe Yarn Mills, Fall River, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Holland & Webb, 487 Broadway, N. Y.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Monument Mills, Housatonic, Mass.
Orswell Mills, Fitchburg, Mass.
Porter Bros, 78 Worth St, New York.
Rockwell, E. M, Leominster, Mass.
Sampson, O. H., & Co., 67 Chauncy St., Boston, Mass.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86-88 Franklin St, N. Y.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Trenton Worsted Mills, Trenton, N. J.
Warren, W, Thread Works, Lowell, Mass.
Whittier Cotton Mills, Lowell, Mass.

Jute Yarns

Eichman & Sternberg, 488 Broadway, N. Y
Wilmington Mills Mfg. Co, Wilmington Del.

Mohair Yarns.

Eichman & Sternberg, 488 Broadway, N. Y
Holland & Webb, New York.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I
Eichman & Sternberg, 488 Broadway, N. Y.
Holland & Webb, New York.
Malcolm Mills Co, 216 Chestnut St, Phila, Pa.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Ramie.

Holland & Webb, New York.
Sampson, O. H., & Co., 67 Chauncy St., Boston, Mass.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Hawes, O. S. & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Ryle, Wm, & Co, 54 Howard St, N. Y.
Silk Lour Mfg. Co, Putnam and Mascher Sts, Philadelphia, Pa.

Spun Silk Yarns.

Champlain Silk Mills, Whitehall, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Hollister Bros, 160 5th Ave, New York.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Mitchell, Jas. E. & Co, Boston, Mass, and Phila, Pa.
Porter Bros, 78 Worth St, New York.
River Spinning Co, Woonsocket, R. I.
Rockwell, Edward M, Leominster, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Abegg & Rusch, 92 Grand St, N. Y.
Alleghany Worsted Mills, Phila, Pa.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson St, Camden, N. J.
Eichman & Sternberg, 488 Broadway, N. Y.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Porter Bros, 78 Worth St, New York.
Sawyer, Manning & Co., 86-88 Franklin St, N. Y.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
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SITUATIONS WANTED.

W. H. COTTON.

A practical mill man is in charge of the Information Department and Overseer's Bureau.

The advertisers in the following columns should be addressed in care of TEXTILE WORLD, or inquiries concerning them may be addressed directly to "Information Department, TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions, are solicited.

Manufacturers are invited to use this department when in need of skilled men; each case will be handled confidentially, with promptness and judgment, and without charge to manufacturers.

WOOLEN SUPERINTENDENTS.

1159 **Woolen Superintendent.** A first class man on carriage robes, furniture plush, bed and horse blankets. Has excellent references. Has held present position as superintendent for several years; good reasons for desiring a change. Age 39; married.

1168 **Woolen Superintendent** wants position. Would accept a position as assistant superintendent or designer in a good mill. Is a good weaver and designer on fine flannels, silk, cotton ladies' dress goods, cheviots, cloakings, beavers, kerseys, etc. Knowles, Crompton, Davis & Furber looms. Age 45; married. Is at present in a good mill. Refers to very reliable parties.

1170 **Woolen Superintendent** wants a position as superintendent and designer of a small mill, or superintendent of a large mill. Age 54; married. Don't want a position in any of the Southern or Western states. Has worked on a great variety of goods, and can refer to reliable parties.

1154 **Agent** or Superintendent, has had a good experience in every department of a cotton mill, and understands manufacturing ducking, carpet yarns, hosiery yarns, seine twine and netting; also various other kinds of white goods. Age 31; single. Refers to past employers.

1191 **Superintendent,** Woolen. A first class man in all respects, well known in the woolen business, now open for engagements. Accustomed to manufacturing most all kinds of woolen or worsted goods.

1174 **Woolen Superintendent** wants a position as superintendent, designer or weaver. Age 47; married. Crompton or Knowles looms, cheviots, suitings, tricots and face goods. Don't want a position in Canada. Good references.

1203 **Superintendent, Woolen,** or superintendent and designer. Age 39; married. Has held a position as superintendent 9 years; 2 years in one mill and 7 in another. Has good references. A good man on meltons, coverts, cassimeres, worsted and kerseys; also serges.

197 **Woolen Superintendent** and designer of a 48 set mill, or will accept a position as designer in a large mill; 40 years of age. Has been connected with some of the best mills in the New England states. All references.

1208 **Designer or Superintendent.** Graduate of textile school. Experienced in most kinds of woolens. During the eight years very successful on fancy worsteds and cassimeres, also overcoatings. 35 years of age and married. The best of references as to ability and character.

COTTON SUPERINTENDENTS.

1108 **Cotton Superintendent** or would accept position as overseer of large mule spinning department. Has good references and a first-class record, and is a thorough mechanic; familiar with all kinds of yarns, especial hosiery and prints; age 40 and married.

1133 Is a good man on cotton goods; age 43; married; American, wants position as superintendent. Refers to first-class companies; is well posted on various kinds of machinery.

1184 **Cotton Mill Superintendent,** wants position. Age 50; married. Sheetings, shirtings, drills, etc.; also all kinds of yarns and yarn dyeing. Has good references. Superintendent eighteen years at one mill.

1177 **Superintendent** wants position in cotton mill. Will accept position as assistant superintendent, or weaver and designer. Is familiar with a great many kinds of work. Has held positions in some of the largest mills in New England, and refers to men who hold high positions in the best mills; age 35; married.

WOOLEN CARDERS.

579 **Carder of the first rank,** has worked in the very best mills, well posted. Strong point; Australian and low stock.

1147 **Woolen Carder.** Age 45; married. Overseer 18 years in one place. Long experience on all wool, wool and cotton mixed, shoddy, etc., etc. Will go anywhere except Canada.

710 **Low stock his strong point,** but has carded all kinds of stock. Age 40; married. Salary $3.00.

1082 **Woolen carder experienced on** all classes of underwear. Has worked for eight years in one mill, 29 years of age and married. Good references.

1190 **Woolen** Carder or Spinner. Age 47; married. One reeler and one piecer in family. Has been overseer and spinner for the last fifteen years for one firm, which is now out of business. Refers to past employers. Can take position at once. Familiar with wool shoddy and cotton; Furbush, Lee and other makes of machinery.

1197 **Woolen Carder** wants position. Overseer over 16 years in some of the best woolen mills. Accustomed to all kinds of work. Age 50; married. Well recommended.

1153 **Comber.** Understands repairing and running combers, speeders and cards. Overseer seven years in one of England's fine mills, on counts ranging from 120s to 150s. Will accept a position as overseer or 2d hand. Refers to responsible parties as to ability and character.

COTTON CARDERS.

910 **Is a good carder** on plain, colored and fancy white stock. Age 41. $2.50 and up.

1135 **Second Hand of Cotton Carding** and combing. Wants position. Has first-class references. Age 28.

1009 **Overseer of Cotton Carding** is open for a position. Age 40; married.

910 **Overseer** of cotton carding. Good man on white or colored yarns, for plain or fancy work. Age 42; married.

241 **Carder,** cotton. Has had a thorough experience as overseer in some first-class mills, to which he refers. Sheeting yarns a specialty

502 **A First** class cotton carder and spinner is open for an engagement. References are of the best.

WOOLEN SPINNERS.

1112 **Overseer of Woolen Spinning** wants position. Has first-class references. Age 37. Wages reasonable. Will accept second hand's position.

967 **Woolen Spinner.** Age 28; single. Wants position where there is an opportunity to rise in the business.

1195 **Spinner, Woolen.** American; age 31; married. Experienced on yarns from 1 to 7 1-2 run. Refers to past and present employers. Wants position as overseer. Will not go to Southern States, Canada or Connecticut. Is an experienced overseer.

1111 **Overseer of Spinning** wants position. Age 48 and married. Has good recommendations from last employers. Has worked on cassimeres, wool shoddy, fancy elderwown and flannels. Will go anywhere.

1152 **Woolen Spinner** wants position as overseer or 2d hand, in Southern or Western States, or Pennsylvania. Age 20; single. Understands Johnson & Bassett operators and mules. Has worked on a variety of goods. Good recommendations as to character and ability.

884 Wants position as overseer of woolen spinning. Age 45; married. All classes of goods; now employed. Best of references.

COTTON SPINNERS.

1198 **Cotton Spinner,** spooling, warping, slashing, web drawing, skein winding and quilting on linen. Well recommended. Age 42; married. Has worked in some of the best mills. Will go anywhere. Would accept a good second hand's position.

1196 **Mule or Ring** cotton spinner wants position as overseer. Age 36; married; 12 years in one mill; 6 years as mule spinner, 2 years as second hand and 4 years as overseer. Has had a very thorough experience on tickings, shirtings and denims. Used to both English and American make of machines. References are good; can accept position at once.

1189 **Spinner, Cotton, Mule or Ring.** Age 38; married. Ginghams, dress goods, flannels and hosiery yarns. English or American make of machinery. References if desired. Don't want a position in Maine, Canada or any Western state.

1187 **Overseer of Dressing** or spinning wants a position in a cotton mill. Is an A1 man on colored or white goods, and understands slashing and beaming thoroughly. American; age 38; married. Has had charge in some of the best mills of New England. Sheetings, shirtings, dress goods, cheviots, flannels and sateens. Familiar with Mason, Whitin and Lowell machinery.

1176 **Ring Spinner, Overseer** wants position on medium, fine or coarse spun yarns; age 38; married. Can take position at once. Can furnish satisfactory references from past and present employers. Good reasons for wishing to make a change.

1121 **Overseer of Ring Spinning,** wants position. Can run spinning, spooling, warping or reeling. Good references. Age 34 and married.

1158 **Overseer of Ring Spinning,** spooling, warping and slashing wants position on white work, fine or coarse. Age 46; single. Will go anywhere. Good references. Familiar with Mason, Bedford, Lowell and Fales & Jencks machinery.

1204 **Situation wanted** as boss spinner, or second hand and mule fixer on Platt mules. Many years experience on yarns for dress goods in England, and also yarns for fine woolen cloth. 35 years old and married; good references.

COTTON WEAVERS.

176 **Wanted.** A position as overseer of weaving, second hand or loom fixer, either in a cotton, woolen or jute bagging mill, by a faithful, sober, steady man, fully capable in either of the above positions. References furnished as to character and experience.

1113 **Overseer of Weaving** woolen or cotton goods; age 30 and married. Will work for moderate pay until ability is proven. Will go anywhere. Has a thorough knowledge of box looms and plain. Can furnish good references if required.

1110 **Overseer of Cotton Weaving,** fancy or plain. Age 42; German. Wants position as overseer, or will take second hand's position. Has had charge where first-class goods are made. Good references.

1073 **Overseer of Weaving,** cotton. Is a good man on fancy work, fine goods, lenos, etc. Has good reference. Age 35; married. Is familiar with the work in some of the best mills in New England.

1127 **Overseer of Weaving.** French. Age 34; married. Understands sheetings, drills and prints. Will go anywhere. Out of work; mill stopped. Refers to past employers.

WOOLEN WEAVERS.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 35; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels Will not go South, West or Pennsylvania.

1047 **Overseer of Woolen Weaving.** Wants position in N. E. States only. Age 30; married. Good man on cassimeres, kerseys and cheviots. Will work for reasonable salary.

1008 **Wants boss job in flannel mill.** Northern New England preferred, also a good man for dresser or fixer, has worked on flannels, serges, cheviots, fancy dress goods. Is 34, married.

1115 **Overseer of Weaving** wants position in woolen mill; age 50 and married; mill stopped, cause of being out of a position; is a reliable man, first-class references; has worked on dress goods, carriage cloths, blankets, etc.

1172 **Wants an Overseer's Position.** Has had charge of weaving and dressing, and is a designer. Crompton, Knowles or Gilbert looms. Two workers in family. Has first class references.

FINISHERS.

1161 **Woolen Finisher** wants position. American; age 37. Don't want to go to Southern or Western States. Has had a thorough experience on cheviots, cassimeres, broadcloths, mohairs, beavers, cloakings, overcoatings, etc. Good references if required.

228 **Is an A1 Woolen Finisher.** Age 36; married. Has been employed in two of the very best mills in New England, and refers to them as to character and ability.

1041 **Woolen Finisher.** Has had experience on fancy and piece dyed goods, cassmeretes, cheviots, worsteds, kerseys and dress goods. Wants position as overseer or second hand in New England States. Age 26 years. Will work for $2 50 per day.

1207 **Woolen or worsted** finisher wants position as 2nd hand in some first-class mill. Has had a good experience as 2nd hand, and refers to past and present employers; age 28. Especially strong on Scotch tweeds, dress goods and fancy cassimeres. Familiar with English and American machinery.

DYERS.

1149 **Woolen Dyer.** American; age 44; married. Familiar with wool and worsted yarns, piece dyeing, cotton, cotton yarns, shoddy and extracts. Good references.

1188 **Dyer** on cotton yarn or thread. Age 28; married. Will not go South or to Canada References if required. Six years' experience as second hand in a first class thread mill.

1194 **Dyer, Woolen**; age 32; married. Has held position as assistant dyer and overseer of dyeing. Refers to present employer; good reason for changing. Could take position on one week's notice; worsted yarns, wool in stock and piece dyes.

1145 **Overseer of Dyeing** cotton. Accustomed to cotton thread, cotton, yarn and chaine warp. Has held the position of overseer in first-class mills and has a general knowledge of cotton dyeing. Age 50, married. Now open for an engagement; have references.

1165 **Dyer,** wants position on cotton goods, ginghams, stripes, and cotton goods in general, long and short chain. Understands sizing. Southern states or Canada preferred. Now in the South. Age 37; married.

1166 **Dyer** on wool or cotton piece skein and raw stock, cotton and silk noils, and mixed, fibres and knit yarns. Age 40; married. Has had a good experience, and refers to good parties.

1146 **Bleacher and Dyer** wants position. Age 35 and married. Is highly recommended by reliable manufacturers; experienced on all classes of underwear; also skein yarns.

1199 **Dyer.** Wants position on fancy cotton skein yarns, and long and short chains Has a thorough knowledge of alizarine and indigo blue dyeing. Has twenty years' experience. Can give first-class references.

1201 **Wants** position in laboratory manufacturing, house or mills, or would accept a position as second hand of dyeing. Age 28; single. Has been employed by two of the best houses in the country. Can take position at once. Western and Southern States barred out.

1175 **Finisher or Dyer,** woolen goods, wants position in Western or Southern States; cassimeres, blankets, dress goods, etc. Refers to mills in which he has held position as overseer; age 43; married. References are good.

KNITTERS.

1163 **Knit.** Good man for hosiery mill; understands buying, selling and finishing. Has had first class experience, and can furnish first-class references. Would accept position as travelling salesman.

1164 **Wants Position** as superintendent of hosiery mill, or overseer of woolen carding and spinning. 35 years of age; 9 workers in family. Has good references, and has had a good experience. For further information address No. 1164, care Guild & Lord.

1131 **Manager of Knitting Mill,** or will accept position as finisher and shipping clerk; age 38. Has worked on cotton and wool, flat and fleece, also rib goods. Familiar with many kinds of machinery. References from first class men.

1182 **Superintendent of Knitting** mill wants position. Has had a good experience as overseer of spinning and carding hosiery yarns, and more recently as superintendent; is familiar with plain, fancy, two-thread, fleece back and glove trimmings. Understands nearly all kinds of machinery. A good list of references. Age 37; married.

1173 **Wants Position** as overseer of knitting department. Understands all kinds of machines; plush work, vertical stripes, full fashioned flat cuff, rib knitting, etc. Refers to good people who have known him for 28 years, and others; age 38, married.

1185 **Knit Superintendent or Overseer.** Have successfully started several plants. Understands all kinds of cotton or worsted underwear, and all kinds of machinery, spring or latch. Age 45; married.

1180 Wants position as 2nd hand of carding in woolen or knit mill. Age 23; single. Has been successful in like position. Prefers position in Mass., R. I., Conn., N. H., Penn., N. Y. or N. J. References if required.

1137 **Superintendent** in knitting mill wants position on knit underwear. Thoroughly understands latch needle, Thompkins Bros, Nye & Tredick, Scott & Williams and Crane Mfg. Co's machines for plush und stockinette. Has first class references as to character and ability. Age 29; married.

1148 **Knitter or Machinist.** Age 28; married. Understands Lamb machines, full fashioned underwear, and ladies' and children's underwear. Good references. Owing to the mill shutting down is now out of work.

677 **Knitter** wants position. Is a man fully capable of handling a knitting plant, hosiery or underwear. Age 32; married. Best of references as to character and ability. Can take position at once.

MISCELLANEOUS.

1087 **Overseer of Beaming, Designing** or Weaving. 35 years of age. Married. Has worked on dress goods, silk striped shirtings, pantaloon goods, ginghams, etc. Highly recommended. Will go anywhere in the United States.

1157 Wants position. Has a general knowledge of all departments in a cotton mill, and can fill most any position. Has highest of references; age 26, married.

1119 **Salesman**, wants position selling dyestuffs. Is a thoroughly posted man in this line; can refer to past employers. Will go anywhere. Age 41 and married.

1124 **Bleacher** wants position. Age 50; married. Has been employed in a first class bleachery for several years, and can furnish good references. Will go anywhere. Wages moderate.

1156 **2nd Hand of Dyeing** or overseer of washing and bleaching wants position. Familiar with knit goods, wool. Age 33. Don't want a position in Canada or the Western or Southern states. Can take position at once; good references.

1162 **Good Man for Beaming Department.** On heavy sized, plain calicoes and colored cotton goods, twills and sheetings. Will go anywhere. Age 33; married. Good references.

549 **Hosiery Superintendent.** Now employed in a first-class mill; wishes to change. Don't want a position in the Southern States or Canada. Has started five new knitting mills during the past ten years. Is an American, 31 years of age and married. Familiar with all kinds of machinery and has first-class references.

1192 **Worsted Steam Dresser** wants position as overseer. Has worked in some of the best mills in England and America. Has high references; age 36; married. Has a thorough knowledge of both plain and fancy work.

1155 **Wool Sorter.** Understands grading all sorts of wool 24 years of age, and single. Will go anywhere, excepting Western States. Can take position at once.

887 **Overseer of Spooling** in a knit or cotton mill. Is competent to take superintendency of a knitting mill. Is experienced principally on fine underwear. 33 years of age; married. Will not go South or to Canada.

533 **Situation wanted** as superintendent in flax, hemp or jute mill. Can make all kinds of yarn, threads, sail twines. Best of references as to character and ability. Twenty years experience in the same line, both wet and dry spinning.

1144 **Salesman** wants position as traveling salesman for dyestuffs, mill supplies, oils, etc., in which line he has had a good experience. Has first-class letters of recommendation from past employers, and others; age 45; widower.

1141 **Overseer of Wool Sorting** wants position. Understands sorting and grading in all its branches; 20 years experience as boss sorter. Can give the best of references from past and present employers. Is a good judge of the shrinkage of wool, and understands the selection of wool in market for mill. Has six workers in family.

1134 Position wanted as designer or assistant superintendent by young man, graduate of the Philadelphia Textile School; now employed. High references.

478 **Woolen Superintendent** wants position as superintendent of a 2 or 4-set mill. Age 41; married; now employed. Familiar with all the improved machinery. Has good references.

1151 **Asst. Superintendent or Designer** wants position. Age 33; married. Worked on cloakings, fancy worsteds, cheviots, dress goods and cassimeres. Can refer to past employers.

1137 **A Salesman for an Underwear** Mill. Would prefer the account of some large underwear mill exclusively. Salary or commission. Is an experienced salesman and with 9 years practice in the manufacture of knit underwear.

1205 **Designer, Woolen**, wants position. Age 30 and married. Refers to some of the best men and mills. Prefers a position in Mass., R. I., Conn., Penn. or N. Y. Experienced on plain and fancy woolens and worsteds, cheviots, cassimeres and fancy tweeds.

1206 **A Young Man**, 27 years of age, who has had ten years' experience in a bleaching department, desires a position. Can bleach for dyed or white work from the caustic soda or lime formula. Can furnish reference as to workmanship, character and sobriety.

1202 **Silk Superintendent** is open for an engagement with a first-class company. Has a thorough knowledge of all the details connected with the manufacturing of silk ribbons and hat bands, from throwing to the finished product. Has held the position of superintendent of a first-class mill for several years. Under 30 years of age, and married. Has the best of references. For any further information address this paper.

Silk Ribbons Superintendent. Is a practical weaver and designer. Has worked in some of the first factories in Germany and in New York, and has an experience of ten years as superintendent and designer. Best references. Salary governed by position. P, 147, care TEXTILE WORLD.

1142 Position wanted as assistant superintendent or designer in woolen mill (N. E. states preferably), by young man 26 years of age, of several years mill experience and a graduate of the Philadelphia Textile School. The salary expected would be small to begin with, as a start is the chief object at present.

TEXTILE MILL WANTED

To Locate in the City of **ELMIRA, N. Y.**

Buildings for manufacturing purposes (one never been used) are located within nine blocks from center of city. Three trolley lines running near by. Steam or electric power supply. Fire hose and connections on each floor. Location is favorable for obtaining help of any kind. Railroad facilities first-class, and cheap rates to all parts of the world.

Address, P 132, TEXTILE WORLD.

FREE SITES FOR COTTON MILLS

Along the line of the Illinois Central Railroad Co. in West Tennessee, Mississippi and Louisiana are offered with cheap fuel, low-priced American labor, best of freight facilities, and, in many locations, exemption from taxation for ten years, with liberal subscriptions to stock, if desired.

Write for pamphlet "One Hundred Cities and Towns Wanting Industries," which gives in a nutshell statistics of desirable places. The undersigned solicits and will treat in confidence all correspondence with those prospecting for new locations.

GEORGE C. POWER,

Industrial Commissioner, I. C. R. R. Co.,

506 Central Station, CHICAGO, ILL.

FACTORY SITES

FOR SALE

in the fast growing village of

DOLGEVILLE, - N. Y.

Water unexcelled for Wool Washing.
Power furnished at very low price.
Good Locations along Railroad.
Best Shipping Facilities.

FOR PARTICULARS ADDRESS

ALFRED DOLGE, Dolgeville, N. Y

FOR SALE.

Two Garnett Machines

Cheap, but in good order with belts. Are sold only as I have no use for them. One is 2 cylinders 60-inch, and the other is 3 cylinders, 48 inch.

"S," care TEXTILE WORLD.

FOR SALE.

The Delhi Woolen Mill,

DELHI, N. Y.

Run by water and steam power. The building is 108 feet by 34 feet; three stories high; fully equipped with machinery. Yearly productive capacity 70,000 to 80,000 yards of cloth.

If not sold as a factory, the machinery is for sale, consisting, in part, of the following:—One set iron frame cards; one Weston press; one 6-4 Curtis & Marble perpetual shear; one Curtis & Marble iron frame, double-cylinder brush; one 300-spindle Davis & Furber mule; one 68-inch Curtis & Marble rotary gig; one 60-inch Curtis & Marble steamer, and one James Hunter Machine Company's fulling mill looms, etc., etc.

This property will be sold at a Great Bargain to the purchaser. Prices and full particulars furnished by

J. H. ROBINSON, Delhi, N. Y.

For Sale or Rent!

Manufacturing Plant in Pennsylvania adapted to Hosiery Underwear or other manufacturing.

Two story building 50x150 feet with two story wing; abundant land to enlarge on. Engine, Boilers, Line Shafting, Dynamo and Gas fixtures in building.

Cheap Fuel. Railroad switch arrangements. Center of 20,000 population with few factories and no labor complications. Distance to Philadelpha 150 miles to New York 165 miles direct.

Address, P 130, Textile World.

Factory Building for Lease or Sale,

BELLEVILLE, ILLS.

Electric light and power and steam heat furnished. Will remodel to suit tenant.

Within 14 miles of business district of St. Louis, Mo. Railroad and shipping facilities unsurpassed. Special inducements from city. Address, **J. G. LEWIS,**
Belleville, Ills.

Wanted. One improved Branson knitter with web holddown attachments; two cylinders, No. 5, 3¼ inch diameter; 336 needles, gauge 24. Give lowest price. Address E. A. Pigeon, Brattleboro, Vt.

Profitable Investment!

A large hosiery mill in the richest part of a strong Gold-Standard western State, equipped with the best automatic machinery, capable of making large profits, needs more capital to properly push business during the coming good times. A man with cash can buy a large block of its stock, with any position desired; or it could exchange gilt-edge trust bonds for the capital needed. Investigate, and get particulars from

P. 149, care THE TEXTILE WORLD,
620 Atlantic Ave., Boston.

FOR SALE, SECOND-HAND MACHINERY.

Double Corliss Engine, cylinder 23x60 in. Single Corliss Engine, cylinder 20x48 in. Singles Corliss Engine, cylinder 16x36 in. Single Corliss Engine, cylinder 12x24 in. 30-40 50-80 and 100 H. P. Automatic Engines.

Large stock of Plain Slide Valve Engines, Boilers, Steam Pumps, Feed Water Heaters, Lathes, Planers, Shapers, Drill Presses, Milling Machines, Electric Motors and Dynamos, and Wood-working Machines. Let me know your wants as my stock is constantly changing. Yours respectfully, FRANK TOOMEY, 131 No. 3rd St., Philadelphia.

WANTED:
An Enterprising Manufacturer

To engage in the production of several new articles in the textile line. These articles are being made of a new raw material which is very cheap, and can be made to resemble, when spun, either linen or woolen thread, at the option of the spinner. Several European countries, where the spinning and weaving of this raw material has been patented, are producing this new class of goods with great success. For further particulars address: **Progress**, care TEXTILE WORLD.

WANTED: Desirable Accounts

One of the largest Importing and Commission Houses wants desirable Domestic and Foreign accounts. Interview or correspondence with mill owners or salesmen controlling same desired.

Address: **L. W. L.**, TEXTILE WORLD.

MANUFACTURER WANTED.

One who has looms 60 inches and wider, to make Union Carriage Cloths for party who will purchase the goods in case lots. Address with samples, specifying prices, and widths, and capacity in yards per month. "S W B," Textile World, Boston.

DYESTUFF SALESMAN WANTED.

Well founded dyestuff manufacturing concern wishes to connect with a first class salesman in this line with a view to partnership. Please address full particulars in confidence to P. O. Box 935, New York.

H. R. STOOPS & CO.,
66 N. Fourth St., Philadelphia, Pa.
KNITTING MACHINE NEEDLES,
And all kinds of Sewing Machine Needles.
Parts for Willcox & Gibbs Mfg., and all Sewing Machines.
Oils, Beltings and General Mill Supplies.
Agents for Excelsior Needle Co., and National Needle Co.

WANTED:

A MAN thoroughly familiar with the manufacture of silk twist; also silk, worsted, mohair and cotton braids of every description. Must be good designer and thoroughly familiar with the trade. Address, BRAIDS,
Care Textile World.

Secretary Wanted.

Wanted: A young man with $3000 to $5000 can secure position of secretary of an important manufacturing enterprise in the South. Excellent opening. Address
SUBSTANTIAL ENTERPRISE,
Box 150, Atlanta, Ga.

Wanted. One or two bright, energetic **salesmen** for a general line of dyestuffs, chemicals, etc. State full particulars as to where last employed, territory covered and salary expected. Liberal arrangements will be made with the right men and all applications considered confidential.
Address P 148, care TEXTILE WORLD.

FOR SALE!
CESSNER CIC.

Latest improved. Good as new.
100 inches wide.
Columbia Mills, Lewiston, Maine.

—South Carolina, Landrum. The Landrum Cotton Mills have been incorporated with a capital stock of $100,000.

—South Carolina, Marion. The Pee Dee Cotton Mills have been incorporated with a capital stock of $50,000.

—South Carolina, Union. The Excelsior Knitting Mills have been incorporated; capital stock $10,000.

—Wisconsin, Appleton. Information reaches us that the Lake Superior Knitting Works, of Marquette, Mich., are about to remove their plant to this city. They will occupy the upper floor of the building now occupied by the Appleton Printing & Paper Co., on the Lake St. bridge. It is the intention of the company to have the plant in running order the first part of February.

—Wisconsin, Milwaukee. The LaCrosse Chenille Works have been incorporated with a capital of $5000. A. R. Miller, B. G. Alexander, and H. A. Loeffeler are the incorporators.

—Pennsylvania, Avon. Thomas G. Spangler of Lebanon, Pennsylvania, has formed a partnership with Stephen A. Light of the firm of Light & Deer of this place, to conduct a business under the name of The Avon Knitting Company. They will manufacture knit goods at Avon.

THE TEXTILE WORLD'S DIRECTORY of the TRADE

This directory will be published for 1897 in one volume of convenient size, in response to the demand that the sectional directories heretofore published quarterly, should appear under one cover. The same general style which has characterized the quarterly issues will be preserved. The map features which have proved so popular will be retained, and improvement made wherever opportunity occurs.

What it will Contain:

A complete directory of textile establishments of the United States, including cotton mills, woolen mills, knitting mills, silk mills, flax mills, jute mills, dye works, print works, bleacheries

Detailed information will be given about each establishment, viz., the name of the company or firm, names of officers, agent, superintendent, what the mill makes, number sets of cards and combs (if woolen), number of spindles, number of looms, whether steam or water power, whether a dye house or not, who the selling agents are, or if the mill sells direct. In many instances it gives the name of the buyer of raw materials and supplies. To the traveling man, this directory is invaluable, as the maps give the location of the towns where there are mills, so that trips may be planned. The railroad connections are given, and distances may be estimated accurately from the maps.

Carefully Prepared Lists!

Besides the complete information concerning the mills outlined above, this directory will also contain carefully prepared lists of:

Dry goods commission merchants in the principal cities.

Dealers in raw materials in the principal cities.

Lists of manufacturing clothiers.

Lists of suit and cloak makers.

Lists of principal jobbers and large retailers, and

Other buyers from first hands. These latter lists will be invaluable to textile manufacturers and sellers of textile fabrics.

Supplemented from Month to Month!

This directory will be supplemented from month to month by the reports in the TEXTILE WORLD, and six months after its publication, a special statistical issue of the TEXTILE WORLD will contain supplementary data accrued in that time.

A Book of Over 300 Pages!

The annual directory will not be one of the regular issues of the TEXTILE WORLD, but a separate publication, containing upwards of 300 pages. It is carefully compiled by the TEXTILE WORLD'S Staff from **entirely independent personal investigation and reports.**

This complete directory will be sent free to every paid up subscriber to the TEXTILE WORLD at time of publication, and it will be included in the regular subscription price, which will be unchanged, viz., $2.00 per year. (It will also be sent to others, as per prospectus in return for courtesy in furnishing information; also to advertisers.)

It is not the present intention of the publishers to sell the directory separately from the TEXTILE WORLD, or at least, if so, the price will not be less than the yearly subscription price to the TEXTILE WORLD, viz., $2.00. There will in all probability be a certain number of copies with special bindings, for which the price, including the TEXTILE WORLD, will be $3.0 . The work of compilation is now actively going forward, and the directory will be issued early in the year.

For accuracy, convenience of arrangement and value of contents, every effort will be made to make it

Superior to any Directory published, regardless of price.

Free to paid-up Subscribers!

FAST COLORS

For Wool, Woolen and Cotton Yarn and Piece Goods Dyeing, and for Calico Printing

ALIZARINE RED, PASTE AND POWDER.

Alizarine Blues, Oranges, Browns, Yellows, Maroon, Gray and Black.
Cœruleine, Galleine, Mythylene Grays.
Thionine Blues, Thionine Indigo, Solid Green and
PATENT BLUES (superseding Extracts of Indigo on account of fastness and color bloom) for Wool and Silk, Benzidine and Primuline Colors, Zinc Dust, Aniline Salts and Oil.

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Sole Agents of the Hudson River Aniline Color Works, Albany, N. Y

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104 and 106 MURRAY STREET,
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Aniline Colors,
Dyewood Extracts,
Sumac and
Nutgall Extracts.

FAST COLORS for wool dyeing, one dip cotton colors, novelties and specialties for calico printing.

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New York and Boston Dyewood Company,

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DYEWOOD EXTRACTS.

Sole Agents for the United States and Canada for
ACTIEN-GESELLSCHAFT FUR ANILIN-FABRIKATION, BERLIN.

Specialties for Wool, Silk and Cotton.

CHROMANIL BROWNS.

New direct dyeing colors of unusual brilliancy and strength, producing fast cutch shades by treatment with Chrome and Bluestone.

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THE STAMFORD MANUFACTURING CO.

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CUT and GROUND DYEWOODS,

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FLAVINES.

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NEW COLORS FOR COTTON

OF THE

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VIDAL BLACK for Dyeing. VIDAL BLACK S for Printing.
THIO-CATECHINE for Dyeing. THIO-CATECHINE S for Printing.
CACHOU DE LAVAL for Dyeing. CACHOU DE LAVAL S for Printing.
Fast to Light, Soap, Alkali and Acid.

MADRAS BLUE. Dyeing on Sumac and Antimony Mordant. The only perfect Indigo Blue on the market. It dissolves readily, dyes evenly and IS FAST.

Send for product and dyed samples, processes, etc., to

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New York. Boston. Philadelphia.

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IMPORTERS OF

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AND DEALERS IN

Dyestuffs, Extracts and Chemicals.

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TRELAVER CHINA CLAY AND CHINA STONE WORKS CO., } ENGLAND, CLAYS FOR POTTERS AND
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No. 70 Kilby St., Boston, Nos. 8 & 10 Letitia St., Phila,

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Aniline and Alizarine Colors, Dyestuffs, Chemicals,

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LATEST SPECIALTIES.

Cresylblue,	OB pat'd.	For Cotton: absolutely fast to Sunlight.	Thio Versuvine,	3BB.	One dip for cotton and mixed goods, wool and cotton silk and cotton.
"	BB "		" Brown,	BB.	
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Naphtazine Blue (Pat.)—a fast acid Navy Blue for Wool.

FAST DIRECT BLUES, Pat'd. for Cotton and Mixed Goods. Wool and Cotton, Silk and Cotton.

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Logwood Extracts,
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And other Fancy Woods.

All Goods Warranted Uniform.

Long Distance Telephone. **UNCASVILLE, CONN.**

Fuller's Earth without Grit,

IMPORTED SOLELY BY

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Woolens washed with Patent Refined Fuller's Earth are much more durable and handle much softer than those cleansed by soaps and other means.

For practical proof of these facts address as above, or

H. N. GARRETT, A. M., INST. C. E.,
101 Sydney Place, . . . Bath, England.

Proprietor of the Midford Fuller's Earth Refining Works.

NASHOBA COMPANY, AYER, MASS.

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A CLEANSING MORDANT FOR COTTON DYEING, PRINTING AND BLEACHING.

FANKHAUSINE Saves Time, Labor, Fuel and Dyestuffs, gives more even brighter, faster colors and softer goods.

By using FANKHAUSINE cotton is dyed directly without boiling out.

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Manufacturers and Importers of

Aniline Colors, Dye Stuffs and Chemicals.

CALLEINE BLUE } **New one dip piece dyes,**
CALLEINE BLACK } **Faster than Alizarine.**

Colors Produced at One Half the Cost.

FRENCH BLACK. FOR WOOL, YARN AND PIECE DYEING.
IMPERIAL BLUE B & BB. VERRITINE PASTE.
DYEWOOD AND TANNIN EXTRACTS OF EVERY DESCRIPTION.

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MANUFACTURERS OF
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ONE DIP BLACK DYE, CUTCH EXTRACT.

Importers of Indigo, Cutch, Madder, Chemicals, &c.

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FOR BLEACHING COTTON. NO ACID. NO SOAP.

Dyestuffs, Chemicals and Aniline Colors.

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ALL DYESTUFFS For Printers, Bleachers, Dyers, and Manufacturers

Special attention given to Starches, Gums, and materials for starching, softening, and finishing all fabrics.

WOOL SCOURING POWDERED POTASH.

Works at DIGHTON, MASS. Sole agents for The Mathieson Alkali Works, Saltville, Va.

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Hartford, Conn., and 372 & 374 Atlantic Ave., Boston, Mass.

Proprietors GROVE WORKS DYEWOOD MILLS.

Agents British Alizarine Co., Brooks, Simpson & Spiller, Anilines, Edward Muck low's Dyeing Extracts, J. R. G. Cochineal, Etc.

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CENEVAN BLUE "C" bright, fast color, specially adapted for Hosiery Goods.

LACTIC ACID, free from adulteration. DOES NOT STRIP.

GENEVAN BLUE. ANATASE BLUE. **ANILINES and ALIZARINES,** GENEVAN BROWN. COTTON WARP BLUE.

Extracts of Indigo, Indigo Carmine, Indigotine, Gendarme Blue, Refined and Reduced Indigo, Dressings and Finishings,

Bisulphite of { Soda, Chrome, Iron.

Alizarine Assistant, Sulphoricinate, Soaps.

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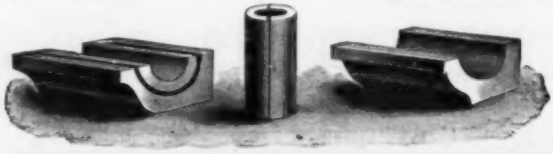

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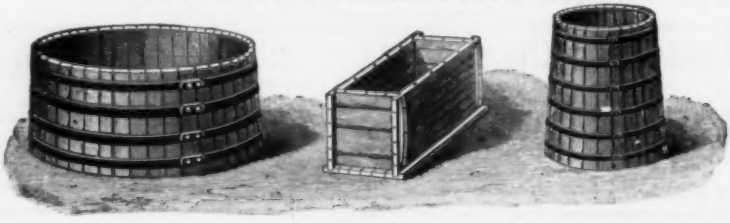

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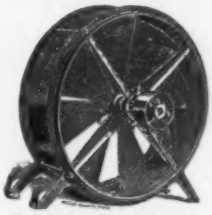

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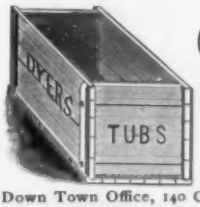

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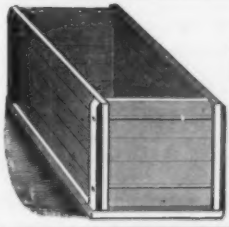

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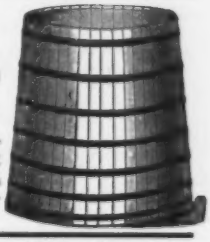

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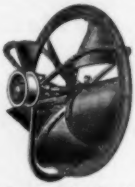

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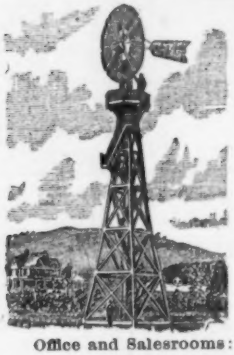

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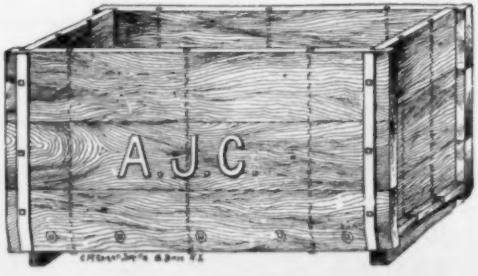

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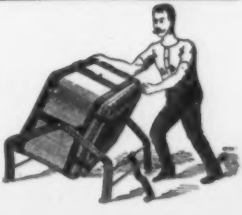

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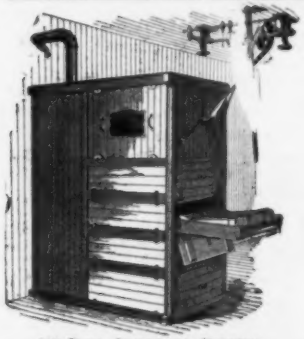

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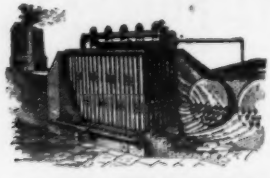

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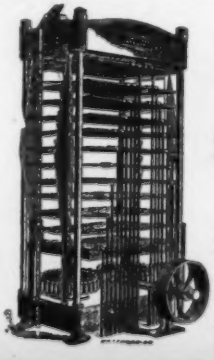

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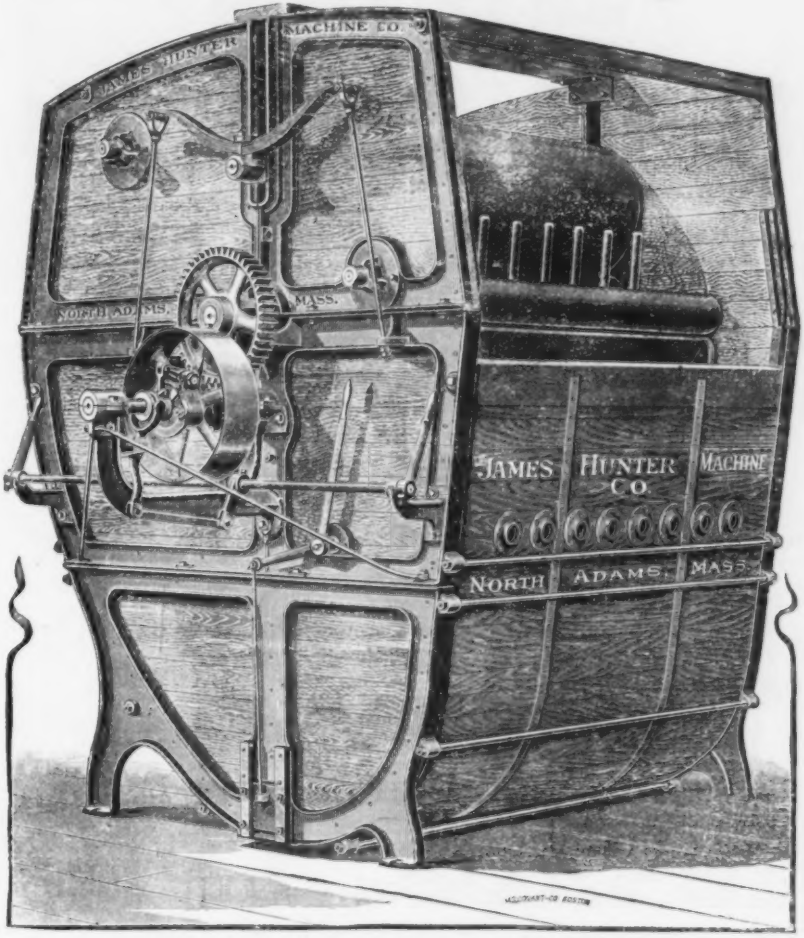

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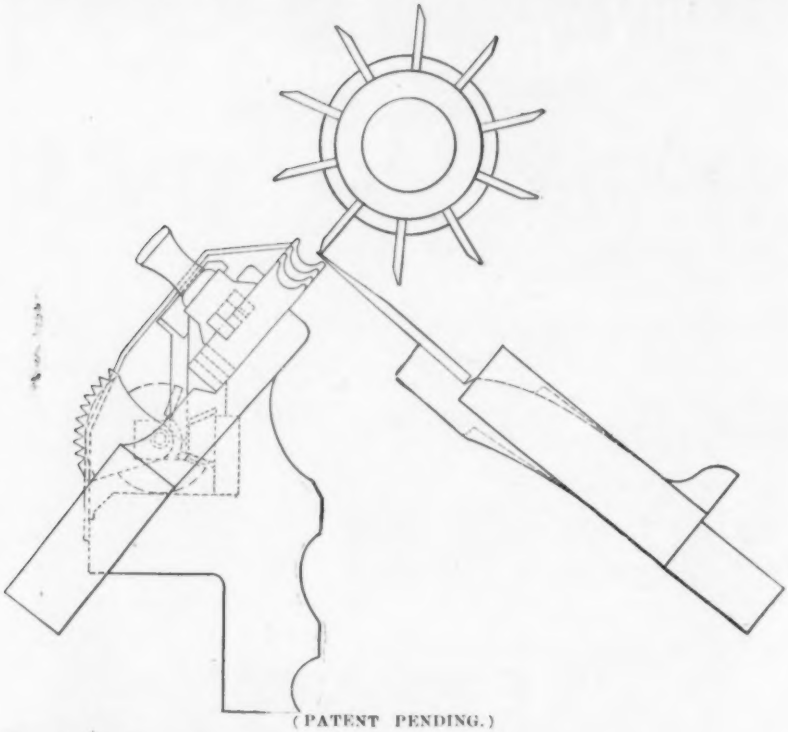

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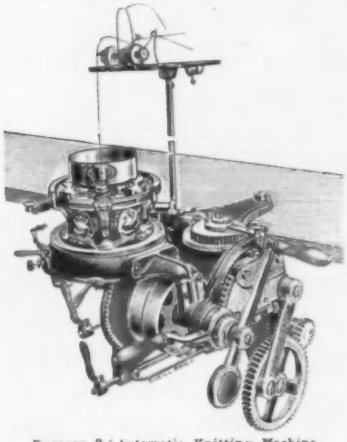

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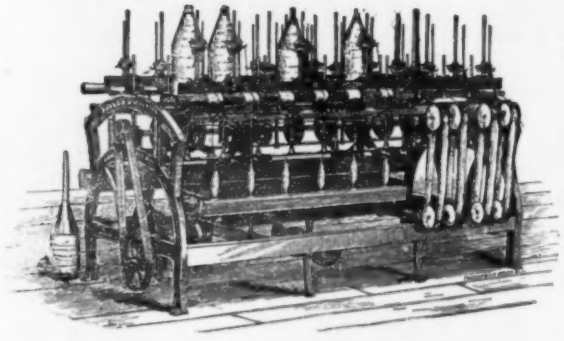

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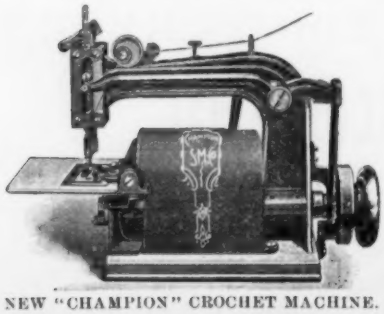

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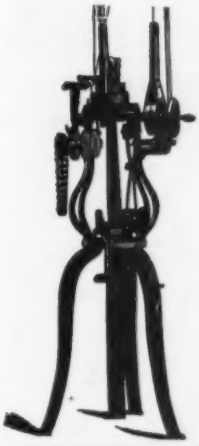

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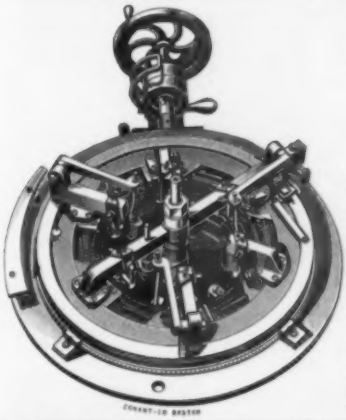

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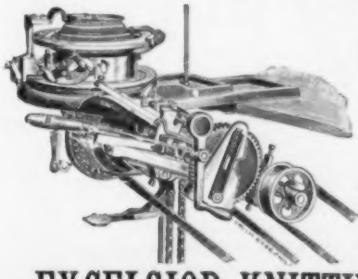

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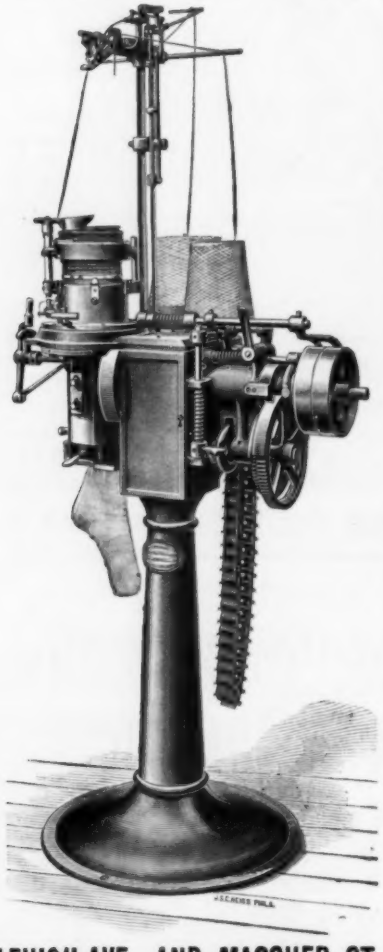

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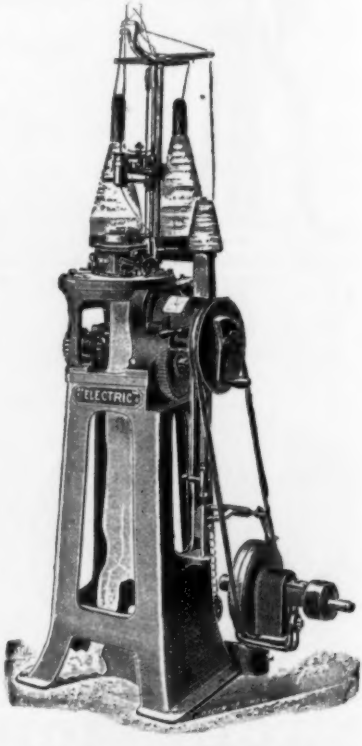

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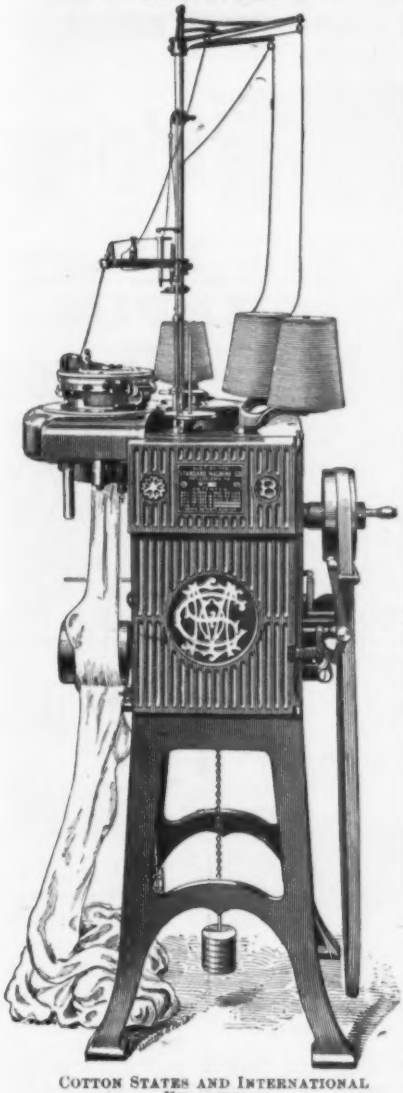

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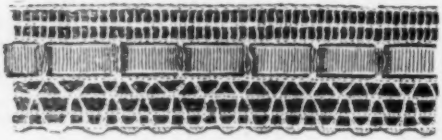
Lace  Edgings

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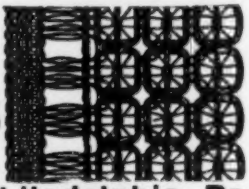

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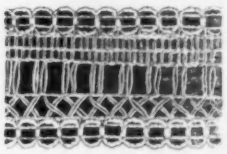

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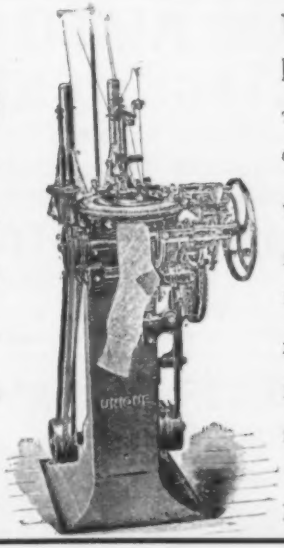

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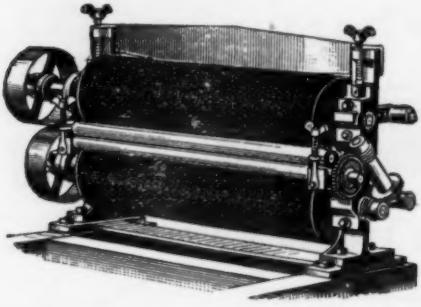

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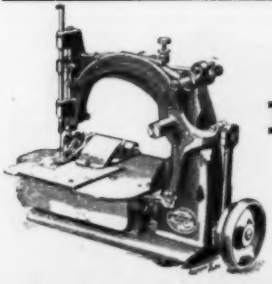

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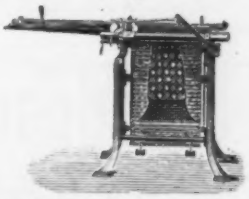

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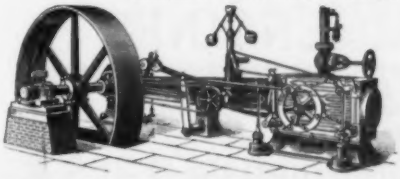

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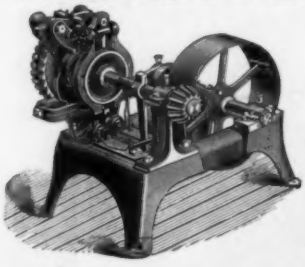

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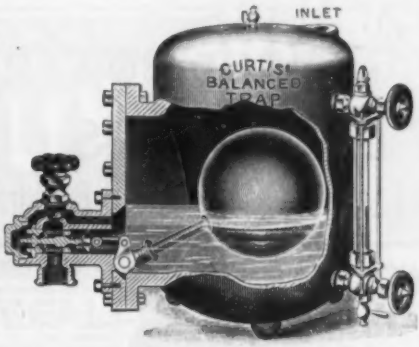

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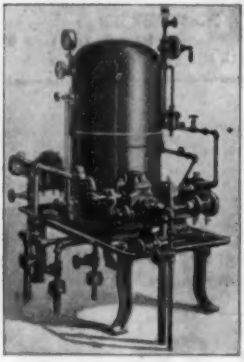

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Hahn's Latest Improved **Watchman's Time Detector.**

This clock is adapted to six or twelve stations and the keys are all different. A liberal allowance made for old detectors. For circulars, prices and further information address,

NANZ & CO.,
116 A Chambers Street,
NEW YORK.

ALEXANDER BROS.
BEST OAK BELTING.
PHILADELPHIA.

TRADE
IMPERIAL
MARK.

ESTABLISHED 1876.
BOILER COMPOUNDS

For the Prevention and Removal of Scale in Steam Boilers.

Please mail us specimen of your Boiler Scale, which we will analyze for you FREE OF CHARGE, and prepare a compound for your special case, and guarantee satisfactory results. Send us a postal card and we will call.

IMPERIAL CHEMICAL CO.,

OFFICE AND LABORATORY, - 324 ST. JOHN STREET, PHILADELPHIA, PA.

BURNHAM'S New Improved Standard ...TURBINE...

It gives on either a Vertical or Horizontal Shaft more power for its price, yields a greater percentage for water used, either with full or part gate drawn, and is the simplest, most durable and best finished wheel made. Send for new catalogue.

BURNHAM BROS., York, Pa.

F. W. DEVOE & C. T. RAYNOLDS CO.,

Send for our new Illustrated Catalogue of 264 Pages.

Fulton and Williams Sts., New York.

Manufacturers of BEST READY-MIXED PAINTS.

A LARGE ASSORTMENT OF DESIRABLE SHADES.

HARD OIL FINISHES AND VARNISHES FOR INTERIOR WOOD WORK.

Designers' Colors, Tools, Brushes, Studies, Paper, etc. Draughtmen's Supplies, Instruments, etc.

PAINT FACTORIES: 98 to 112 Horatio St., and 99 to 111 Jane St., New York.
VARNISH WORKS: 213 to 219 New Jersey R. R. Ave., Newark, N. J.

COFFIN, DEVOE & CO., 176 Randolph St., Chicago.

PASSENGER AND FREIGHT
ELEVATORS
THE GRAVES ELEVATOR CO.
53 STATE STREET, BOSTON.
92-94 LIBERTY ST. NEW YORK.
HODGES BUILDING, DETROIT.
ROCHESTER, N.Y.
2500 IN USE

SMEALLIE BROS.

BOILER FEED and TANK PUMPS

In four sizes for Ho or Cold Water.
No. 2 Single, 130 gals. per Hour.
No. 3 Single, 420 gals. per Hour.
No. 3 Double, 840 gals. per Hour.
No. 4 Double, 1680 gals. per Hour.

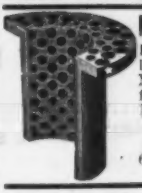
Strongest and Cheapest Pump in the Market.

Write for Circular and Prices.

24 Livingston St., Amsterdam, N. Y

ELEVATORS. Hoists Waiters for any place, capacity or weight, Electric, Steam, Hydraulic or Manual Motors, Shafting, Pumps, Boilers, Pipe, Rope, Drug and Paint Mills, Presses, Gearing, Mining and Coining Machinery, Street and Road Making and Sweeping Machinery.

GEO. C. HOWARD, 1783 Barker St., Phila., Pa.



Metalined or Oilless Bearings

For Loose Pulleys and other bearings. Perfectly clean. No cutting or danger of fire from overheating. Send for Loose Pulley circular No. 5.

North American Metaline Co.

62 W. Av. cor. 3d St. Long Island City, N. Y.

Endorsed by Board of Fire Underwriters.
SUPERIOR TO
COTTON WASTE.
Safe, Durable and Cheaper.

RAW SILK MACHINERY WIPERS.

AMERICAN SILK MFG. CO.,
311 Walnut St., PHILA., PA.
Endorsed at the recent meeting of N. E. Cotton Mfrs.

TEXTILE BOOKS, HALF PRICE.

Structure Fibres, Yarns and Fabric, price $5.00, will sell for $2.50.
Wool Manufacture (Beaumont) price $2.50, will sell for $1.25.
Book on Fulling price 75 cents, will sell for 37.
Possett's Technology of Textile Design, price $5.00, will sell for $2.50.
I have a few practically new copies of each.
JOS. C. WILLIAMS, Box 101 South End, Boston.

Capital, $1,200,000.

100,000 SPINDLES.
Weekly Product 120,000 lbs.
14's to 160's.

HIGH GRADE

Cotton Yarns,

SPECIALLY ADAPTED FOR

Silk, Plush, Upholstery & Hosiery

MANUFACTURERS.

American Peelers. Sea Island. Egyptian Cottons.

Superior Qualities Combed and Carded—Furnished in singles, 2, 3, 4 and 6-ply hain warps, skeins, beams, spools, tubes, cones and Lisle Thread yarns.

Cops for Weaving and Twisting. Cops for Hosiery.

GLOBE YARN MILLS,

Fall River, Mass.

E. B. JENNINGS. - - Treasurer.

Arnold B. Sanford, *Pres.* Arthur H. Mason, *Treas*
Capital Stock, $500,000.

Sanford Spinning Co

FALL RIVER, MASS.

30,000 Spindles. Weekly product, 50,000 pounds 14s to 40s.

NOVELTY COTTON YARNS,

FROM AMERICAN PEELERS AND EGYPTIAN COTTONS.

OUR SPECIALTY: Superior qualities of Hosiery Yarns, Natural Shades of Cottons, and in Colors, Jaegers, Mixes, and Bleached, Hosiery Cops on Long Tubes, Skeins, Tubes, Cones and Lisle Thread Yarns. Furnished in Carded and Combed Qualities in Singles, 2, 3 and 4-plies.

YARN DEPARTMENT.

Eastern Yarn Market.

Worsted Yarns. Spinners are getting few orders again. The fact of early sales for deliveries during the coming heavy weight season is apparent. Weavers are much discouraged at the way buyers are taking hold of worsted cloth. The market appears to be indifferent to the fact that an advance of the duty on wool is near at hand. Goods are being fairly well bought, but manufacturers do not know whether the trade will hold out. The spinners are heavy purchasers of wool. The indications now are that the duty on wool will be 8 cents per pound, not over. The wool growers on the Pacific slope seem to be the most sensible of all the wool growers demanding a duty. Those of Ohio and Michigan seem to be crazy. They appear to believe that this country was built for their especial benefit. It seems strange that the wool growers of that section cannot meet New England manufacturers in a right manner. New England has made concessions, but Ohio and Michigan representatives are not only pushing their selfish ends, but are ugly, and are calling on the different sections of those States for money. Why should money be needed to put forth their cause, if a good one? The principal occupation of the worsted spinners at this time, is seemingly the tariff fight. There has been over nine different propositions submitted. Fourteen worsted spinners of Philadelphia, signed a petition calling practically for a 53 cent duty on 50 cent yarn. The schedule finding favor with weavers, is the one being advocated by Geo. Sykes, which calls for a protective duty on yarn of 30 per cent, and a compensatory duty three times the cost of wool of the first class, in the grease; a duty on thread waste and ring waste of 9 cents, on slubbing waste and noils of from 11 to 15 cents, probably 11 cents per pound. Spinners are trying for higher prices, manufacturers also say they must have higher prices, because of the tariff. We fear from what we hear that their advances in price will not meet with success. The cheviot goods still are in demand. The fine worsted spinners will later get orders, as weavers are disposed to soon commence the purchase of yarn for future requirements.

Woolen Yarn. Spinners are getting orders, while buyers are trying to get business fixed before the tariff agitation begins in March, and many orders will be placed during this month. All anticipate an advance and are covering to some extent, although it is a fact that, with almost a certainty of higher prices, the buyers of woolen goods are placing no orders or not in sufficient quantities to warrent any marked advance in price. The clothing stocks are all reduced. Indeed we are informed that many of the leading clothiers and manufacturers are absolutely without stocks and are only cutting as orders come forth. Many thousand pounds of wool have been purchased by speculators and spinners. Knitters have either ordered earlier or have placed few orders. As has been said by a leading manufacturer, the buyers of cloth and underwear do not seem to appreciate the fact that a tariff is to be placed on goods which, in consequence, will be advanced in price. It has been figured out that the only way a manufacturer can make money is by closing his mill and waiting for the upward turn of affairs which will surely come.

WORSTED YARN.

Fine Australian.

2/40s . . . . . 74 cts.

Continued on page 167.

Frank E. Patterson, Prest. Oscar W. Wood, Treas

GERMANTOWN SPINNING COMPANY INCORPORATED GERMANTOWN JAN. 9TH 1890

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. E. J. CARRIGAN, Sec.
Established 1860.—Incorporated 1893.

THE S. BLAISDELL JR., CO.,

Egyptian COTTON Peruvian

American Long Staple a Specialty. and all American Southern points.

Shipments direct to mill form Egypt, Peru
CHICOPEE, MASS.

Established 1865.

H. M. WITTER & COMPANY,

Manufacturers of

COTTON WEBBING, TAPES AND BINDINGS,

Worcester, Mass.

WEAVING and HOSIERY YARNS.

We Buy for Cash

WARPS, COPS, TWIST and SOFT SKEINS, Single, Double, 3-ply, 4-ply, etc.

COLORED YARNS for HOSIERY

on Cones, a Specialty.

Correspondence Solicited.

EDWARD S. HYDE, 223 and 225 Chestnut Street, PHILADELPHIA PA.

W. WARREN THREAD WORKS,

Manufacturers and Importers of

Polished Threads and Cotton Yarns,

WESTFIELD, MASS.

Colored Yarns and Threads on cones a specialty. We manufacture spool cotton, sewing thread, button-hole cord and seaming thread put up in any form to suit the trade. Samples sent upon application and correspondence solicited.

Our Bleaching and Dyeing facilities are New and Unsurpassed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

Continued from page 165.

Other numbers in proportion.

2/50s . . . . . 79 cts.

Half-blood domestic.

2/40s . . . . 68-72 cts.

DOMESTIC.

1/4 Blood,

2/28s, 24s, 18s . . 52 cts.

2/32s . . . . . 54 cts.

3/8 Blood,

2/32s . . . . . 59 cts.

2/28s, 24s . . . . . 59 cts.

1/2 Blood,

2/22s, 28s . . . . . 51 cts.

Single and Double Roving Cotton Yarn. Spinners are booking orders for heavy weight yarn, in numbers which range from 1/7s to 1/10s, deliveries to begin in April and May. The prices paid for yarn are low. The market in some spots seems demoralized. In one section we hear of a sale made of twenty to 30,000 pounds of 1/20s at 14 3-4 cents, and the spinner paid a commission of 7 per cent. for selling. Knitters are getting orders, and anticipate orders, but the season for buying is, as a rule, getting later each year. It would have opened earlier this season, but the knitters by cutting prices at the slightest pressure frightened buyers away. Many were on hand to look at samples, but the uncertainty of where prices were going deterred them. The indication now is that they will return again about February 15th. The inquiry for yarn is good, and orders are being placed to some extent, but the price of cotton does not warrant haste, and some knitters feel that if they wait too long, yarn will be still lower. The knitters have not secured many orders, and some are getting discouraged. The cheap garments are suffering as badly as the better makes. The ribbed underwear mills will use very little colored yarn this season. Jaeger is not in demand. The trade will be either on white yarn, or silver gray.

Combed Allen and Egyptian. Spinners are getting orders for heavy weight yarn, and also for light weight yarn.

Continued on page 169.

SAWYER, MANNING & CO.,
YARNS,
86 & 88 Franklin St., NEW YORK

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY
54 Leonard St., New York.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
51 & 53 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY YARNS,
All Plies and Numbers.
Imported Yarns a Specialty.
82 and 84 BEDFORD ST., FALL RIVER, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 40s and above. AND
FITCHBURG, MASS. WARPS

YARNS All Numbers and Qualities.
HOLLAND & WEBB,
478 Broadway, New York.

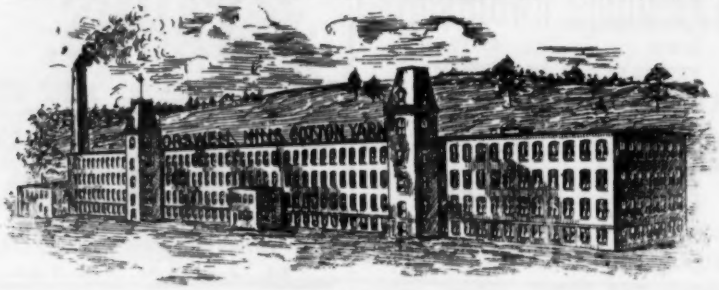
TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON WARPS
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

TRENTON WORSTED MILLS,
Trenton, N. J.
Manufacturers of
All Numbers of Worsted Yarns.
Knitting and Floss Yarns a Specialty.
A. FOSTER, Superintendent.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.



COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

PLAIN AND FANCY PATTERN

Cotton Warps,

WHITE, MIXED AND COLORED.

For SATINETS, BLANKETS, ETC.

WHITTIER COTTON MILLS,

LOWELL, MASS.

Hosiery AND Weaving Yarn

ALBERT IVINS CROLL, BOSTON

YARNS

SOLIS - - BOSTON.

179 Devonshire Street.

ANDREW J. SOLIS, Jr. & CO.

Cotton Yarns AND WARPS Of Every Description.

James F. White & Co.

COMMISSION MERCHANTS,

54 an 56 Worth St., NEW YORK.

228 Chestnut St., PHILADELPHIA.

BURLAPS all WIDTHS and WEIGHTS.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double and Twist,

COTTON WARPS

HOUSATONIC, MASS.

4s to 60s.

SAVOGRAN

CLEANS WOOL, FLOORS, ANYTHING.

INDIA ALKALI WORKS, Boston.

Continued from page 167.

The summer underwear is to be late this season. Buyers have been holding off, and are placing orders sparingly. The demand for heavy numbers is going to be in 9s to 10s. Garments are being ordered heavier each year, and some knitters claim that to a certain extent they are superseding the wool garments. Knitters would do well to purchase combed yarn on a percentage of combing. Some yarn is combed but slightly, and sells much less than the better combed yarn, and some yarn is being sold for combed yarn, which is not combed at all. We note a combination of three very large spinning and thread mills in New Jersey under the management of the Coates, and we understand that this has extended to the English branch of these concerns. Business to-day is a contradictory mess of uncertainty. Cohoes, Bennington, Amsterdam, Little Falls, Herkimer, Utica, and all along the line, are curtailing production.

DOUBLE ROVING WHITE COP YARN.

11s and 12s	14	cts.
16s	15	cts.
20s	18	cts.

Jaeger and Camel's Hair.

10s to 12s	16	cts.

Cones 1 cent extra.

Other colors quoted on application.

Egyptian Combed.

1/10s to 12s	27	cts.
1/20s	28	cts.
1/34s	31	cts.
1/40s	32	cts.
1/45s to 1/50s	37	cts.

Cones extra price.

ALLEN SEED COMBED.

1/10s	24	cts.
1/40s	32	cts.
2/40s	37	cts.

Carded Egyptian.

1/20s	21½	cts.

Philadelphia Yarn Market.

There has been little change in the price of yarns the past month, excepting hosiery yarns, as many yarns had gotten so low that there was no chance

Continued on page 171.

KERR THREAD CO.
—SPINNERS OF—
Fine Combed Sea Island **COP SINGLES**
All Numbers, 30s to 150s.
Fall River. Mass.

J. D. KENNEDY, Lessee
North Athens Cotton Mills,
Manufacturer of
COTTON WARPS AND YARNS
In numbers from 4s to 14s.
ATHENS, - - TENN.

ABEGG & RUSCH,
WORSTED YARNS
Dry Spun, Nos. 36s to 100s.
COTTON YARNS
Nos. 12s to 120s.
92 GRAND ST., NEW YORK.

WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER. - MASS.

A. HERBST. J. W. JONES.
HERBST & JONES,
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets,
PHILADELPHIA.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

EICHMANN & STERNBERG
488-492 Broadway, NEW YORK.
COTTON WOOL SILK **YARNS** For Weaving Knitting or Embroidering.
HARNESS TWINES.

WOOLEN AND MERINO
YARNS. Special line for Bicycle and Golf Goods in all shades
For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
New Richmond, O.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:
Broadway and Jefferson Avenue,
CAMDEN, NEW JERSEY.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

Worsted YARNS,

ALL NUMBERS SINGLE AND TWO-PLY,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes.
Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

The Competition of Foreign Goods

On staple and plain fabrics under present tariff conditions makes it almost impossible to make any money, and the only hope of profit in making Dress Goods, Cloakings and Cassimeres seems to be in using

MOHAIR OR NOVELTY YARNS.

In the United States we are the only manufacturers from raw materials to finished product who make such yarns ONLY.
Perhaps we can be of use to you.

CRANSTON WORSTED MILLS, Bristol, R. I.

George Campbell & Co.

Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

RIVER SPINNING COMPANY,

WOONSOCKET, R. I.

Belgian System WOOLEN and MERINO **Yarns.**

In any shade or quality suitable for making any class of Goods, domestic or foreign at prices to insure competition with imported goods of any description.

Selling Agents: JOHNSON & FARIE. Apply to Andrew Adie, 570 Bourse Building, Philadelphia.

Continued from page 169.

to make further reduction in values. There has been a considerable scarcity in warps the past week or ten days. 20s warps have brought readily 1-2 c. to 3-4 c. advance; 26s and 22s also were marked up a fraction. Business, we think, on the whole, is getting somewhat better, as there are more orders, and some of the orders placed early in the season are now running out and being renewed, although customers are not buying in as large lots as they do when business is good. They are relying on being able to place future orders at no higher prices. We quote:

WARPS.

20/1	13 cts.
26/1	13¼ cts.
22/1	13 to 13¼ cts.
12/2	13 cts.
14/2	13 to 13½ cts.
30/2 Eastern	17 to 17½ cts.
30/2 Southern	16½ to 17 cts.
30/1 Southern	14 to 14½ cts.
30/1 Eastern	17 cts.
14/1 Southern	12½ cts.
16/1	12½ to 13 cts.

SKEINS.

26s soft	13 to 13½ cts
20/1 "	13 to 13¼ cts.
19/1 "	13 to 13¼ cts.
4s to 10s soft	12 cts.
10s to 12s hard	11½ to 12 cts.
12s soft	12 to 12½ cts.
14s "	12 to 12½ cts.
20/2 medium	13¼ cts.
16/1 soft	12½ to 13 cts.
14/2 hard	12½ cts.

SOUTHERN CONES.

6s to 8s	12¼ cts.
10s	12¼ cts.
12s	13 cts.
14s	13 to 13½ cts.

Continued on page 173.

IF YOU USE CUTS
HAVE THEM ELECTROTYPED BY
H. C. WHITCOMB & CO.
ELECTROTYPERS,
42 ARCH STREET,
BOSTON.

O. H. SAMPSON & CO.,
YARNS,
BOSTON, 67 Chauncy St.
NEW YORK, 58 & 60 Worth St.
PHILA. 206 Chestnut St.

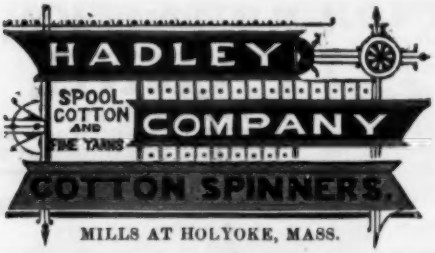
Cohannet Mills,
TAUNTON, MASS.
Spinners of High Grade
HOSIERY YARNS OF EVERY DESCRIPTION.
Selling Agents JAMES E. MITCHELL & Co, Philadelphia and Boston.

B. F. BOYER & CO.,
Successors to GEORGE SHIMER & BOYER,
HOSIERY YARNS,
In Wool, Merino and Worsted.
GOLF YARNS,
In Wool and Worsted. Also carry a full line
BUNDLE YARNS
For the Jobbing Trade.
516 Market St., Philadelphia.
MILLS, CAMDEN, N. J.

PORTER BROTHERS & COMPANY
Commission Merchants,
Trimmings, Buttons and Knit Underwear.
Sole Agents for
John Paton, Son & Co.,
OF ALLOA, SCOTLAND.
Specialties:
SCOTCH MIXTURES
For Sweaters, Golf and Bicycle Hose, Mitts, Gloves, etc.
78 & 80 Worth St., New York.
72-82 Lincoln St., Boston.

JAMES E. DALY
Manufacturer of
WOOL EXTRACTS and SHODDIES,
P. O. Box 395,
Paterson, N. J.
Fancy Colors a Specialty. Long Distance Telephone.

FINISHING MACHINERY for Brushing, Calendering, Drying, Dyeing, Fulling, Lapping, Rolling, Folding, Measuring, Pressing, Steaming, Shearing, Singeing. Blades, Spirals, Brushes furnished or repaired; Wire Looms, Forming Press for Febrille Goods, Metals or Hats. Perforating, Plate Printing, Engraving Machines. Paper Mill, Box Printers and Binders Machines.
GEO. C. HOWARD, 1783 Barker St., Phila., Pa.



SPINNERS OF

FINE COTTON YARNS

30s TO 100s.

Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.

Fine Cotton Warps, single and two-ply, in chain, etc.

95 Milk Street, BOSTON.

THE WILLIAM CLARK COMPANY,

WESTERLY, R. I.

Mills equipped with the latest and most improved machinery.

Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.

Also 2, 3, 4, 5 ply and 6, 9 and 12 plv cable laid.

Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.

The J. R. Montgomery Co.,

WINDSOR LOCKS, CONN.,

MANUFACTURE

LOOP OR BOUCLE YARNS, in Mohair and Worsteds.

COTTON SPIRAL OR LENO YARNS, to give leno effects with plain weave.

COTTON FLAKE OR KNOP YARNS for new effect in Cotton dress goods.

HIGH GRADE COTTON WARPS.

Also printers of Cotton, Wool or Silk Yarns.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

THE WILMINGTON MILLS MFG. CO.

MANUFACTURERS OF **JUTE GOODS,**

CARPET FILLING AND RUG YARNS,

Wrapping, Baling, Tobacco, Hop and Wool Twines. Cords, Ropes, Packing and Specialties

WILMINGTON, DEL.

FIRE DEFIED!! By The American Fire-Resisting Paint.

A building protected with these goods becomes practically Fire proof.

An ocular demonstration of the fire resisting qualities of this paint and kalsomine will be given at our office to anyone interested. Samples, and information furnished from those who have used this paint successfully.

THE AMERICAN FIRE-RESISTING PAINT CO., 17 Broadway, New York, N. Y.

Continued from page 171.

16s	13½ to 14 cts.
20s	15 to 15½ cts.
24s	15½ to 16 cts.
26s	15½ to 16 cts.

Eastern skein, 1-2 c. above cops.

Eastern cones, 1-2 c. to 1 1-2 c. above cops.

Egyptian carded, 4 c. to 5 c. above white.

Egyptian combed, 4 c. to 5 c. above carded.

For wool spun yarn the demand very light. No orders are being placed, in large quantities. Spinners are running on very short time. We quote:

20s cut black cops	13 to 13½ cts.
12s " " "	12½ cts.
15s " " "	12½ cts.
22s " " "	14 cts.
16s to 20s white	13½ to 14 cts.

Woolen yarns very dull and orders scarce.

SOUTHERN COPS.

6s to 8s	12 cts.
10s	12 to 12½ cts.
12s	12½ to 13 cts.
16s	13 to 13½ cts.
10s to 12s shuttle	12 to 12½ cts.
6s to 8s shuttle	12 to 12½ cts.

MIXED COLORED CONES.

6s to 8s	14½ cts.
10s	14½ to 15 cts.
12s	15 cts.
14s	15½ to 16½ cts.

SKEIN.

8/3 carpet	11½ to 12 cts.
8/3 slack	11¾ to 12 cts.
9/4 slack	11¾ to 12 cts.
10s double reeled	12 to 12½ cts.
16/3 slack	13 to 13½ cts.
16/4 medium	13 to 13½ cts.
2-1/2 to 4s soft	12 cts.
8s to 10s "	12 cts.

EASTERN COPS.

26s shuttle	13½ to 14½ cts.
40s "	17 to 18 cts.
12s "	14 cts.
10s hosiery	13½ to 14 cts.
12s "	13½ to 14 cts.
16s "	14 to 14½ cts.
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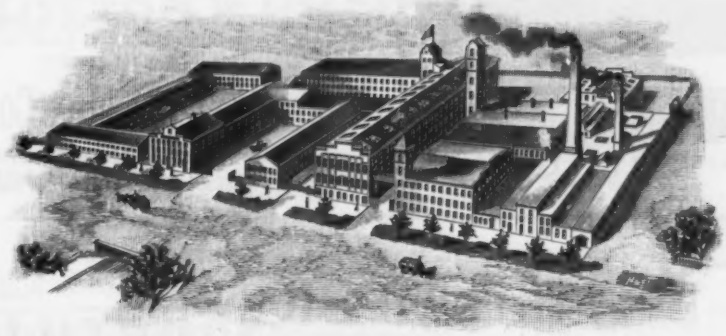

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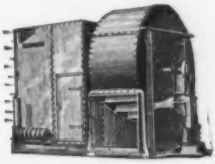

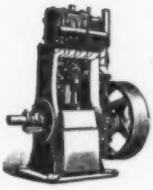

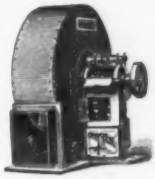

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